

PD2CII™ - Plant Design-to-CAESAR II Translator

(for Elomatic's CADMATIC)

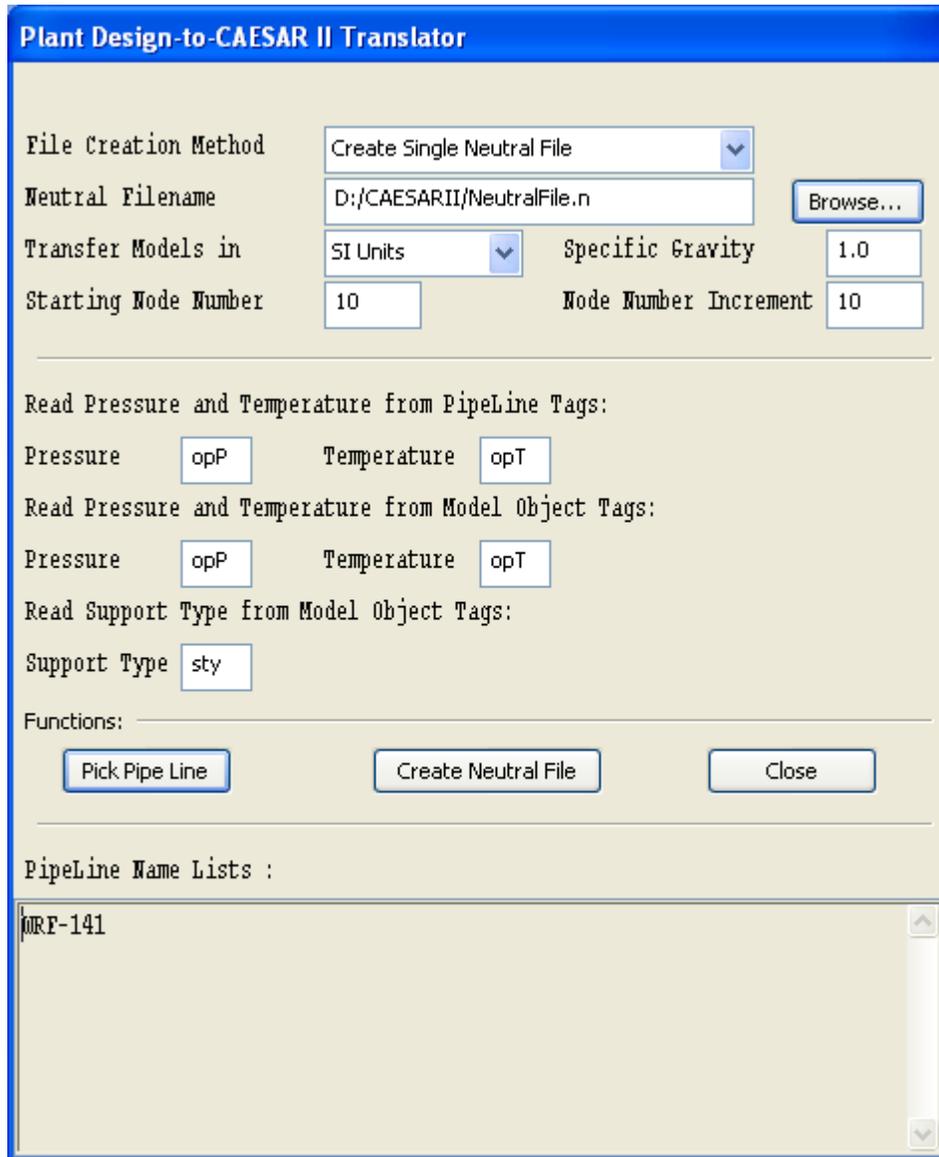
1.0 Installing Program

To install PD2CII on Windows NT, load the product CD supplied by InfoPlant and execute the followings steps:

1. Browse the CD, and run the program "SETUP.EXE" and follow the instructions as they appear on the screen.
2. After successful installation of the program, create an environmental variable with the name "CAD2CII" and set the value of the variable as "PD2CII_Installed_Path" (assuming the PD2CII is installed in "d:\cad2cii", the value would be "d:\cad2cii").
3. The environmental variable can be set automatically as given below.
 - Open the Control Panel window and open the System Properties window by double clicking the "SYSTEM" icon from within the Control Panel window. Select the "Environment Variables" button from the "Advanced" tab for Windows 2000 or select the Environment tab for Windows NT and click "NEW" button.
 - Then enter in the Variable prompt "CAD2CII" and "PD2CII_Installed_Path" (where the PD2CII is installed) in the Value prompt, for example "d:\cad2cii".
 - Once entered, select the "Set" button to confirm.

2.0 Neutral File Extraction

- 1 Load the CADMATIC Plant Modeler and run the macro "CADMATIC.mac" available in the installed path of PD2CIII \ through "Macros->Select and Run". The following form appears.
- 2 Pipes selected for Transfer need to be checked for the following.
 - a. Pressure and Temperature of the Pipeline defined using Pipeline Tags or Model Object Tags.
 - b. By default, the analysis code is set to "B31.3". The Analysis code can be changed by creating a user defined tag to the CADMATIC project with the name "acO" (Analysis Code) and assigning the same to the pipeline.
 - c. Support type can be transferred to CAESAR II by creating a user-defined tag to the CADMATIC project with the name "sty" (Support Type) or any other tag name and assigning the same tag to the component connecting the pipe and the pipe support such as U-clamp, O-clamp, etc., at each pipe support location. The tag created as stated above should be set a value as given in the field #1 of the access db "SupportType.mdb" available in the installed directory of CAESAR II to transfer the support type.
 - d. If the MMT_LEAVE_GASKET_GAPS is set to 1, then the translator treats the same as real gaps and puts an anchor at that location.



- 3 Selecting the option “Create Multiple Neutral Files” creates a set of files in the specified directory. The names of the files are identical to the name of the pipe(s).
- 4 Secondly, selecting the option “Create Single Neutral File” creates one neutral file for all the items in the specified neutral file name.
- 5 Selecting the option “SI Units” transfers the Pipes details in SI units i.e. Length related dimensions such as OD, Nominal Size etc in mm, Temperature in Deg C, Pressure in bar, Weight in Kg, Density in Kg/m³, Translational Stiffness in N/mm, Rotational stiffness in N-m/deg to the neutral file.
- 6 Similarly selecting the option “ENGLISH Units” transfers Pipes details in ENGLISH units i.e. Length related dimensions such as OD, Nominal Size etc in Inch, Temperature in Deg F, Pressure in psi,

Weight in lb, Density in lb/in³, Translational Stiffness in lb/in, Rotational Stiffness in lb-in/deg to the neutral file

- 7 Enter the Starting Node number and Node increment value in the appropriate field. By default, the Starting Node number and Node increment are set to 10 and 10 respectively.
- 8 The Specific Gravity of the fluid (with respect to water) is set to 1.0 by default. User can change Specific Gravity by entering the appropriate value in text box.
- 9 The Function 'Pick Pipe Line' lets the user to select the objects from the graphics. The user can select entire Pipelines or the portion of the Pipes.
- 10 The option 'PipeLine Name Lists' displays the names of the pipeline thus selected from the graphic.

3.0 Limitations

1. Insulation Density and Insulation thickness are not transferred to CAESAR II at this time.
2. Corrosion allowance and Mill tolerance are not transferred to CAESAR II at this time even though the provision is available in the Neutral File.
3. Lining Density and Lining Thickness are not transferred to CAESAR II at this time.

4.0 Reference

Loads

Temperature and Pressure values entered at Pipes and Standard components via OpT and opP shall be transferred to CAESAR II. Hence, user should fill these attributes with appropriate values depending upon the Units of transfer. I.e., If you wish to transfer the model in SI units, then the value enter for Temperature and Pressure should be in Deg C and bar respectively. On the other hand, if you wish to transfer the model in English Units, then the Temperature and Pressure values shall be entered in Deg F and psi respectively.

Fluid Density

Specify the Specific Gravity of the fluid (with respect to water) during the transfer of the model.

Weight

The weights of Valve, Instruments, Flanges, etc. are extracted from the Dimension Table through first mass quantity type attribute. If defined/available in the Database, the program extracts the information and transfer to CAESAR II.

OD, Wall Thickness and Nominal Size

Nominal Size is extracted from the first NS Quantity type of Dimension Table. Similarly, OD and Wall Thickness is extracted from first diameter and first wall thickness quantity type respectively from CADMATIC Dimension Table. For reducers and tees, the arrive OD and Thickness will be read from first Diameter and Wall Thickness quantity type and leave OD and Thickness will be read from second Diameter quantity type and Wall Thickness quantity type.

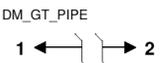
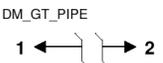
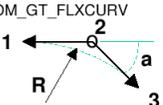
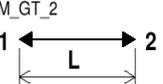
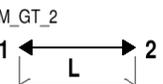
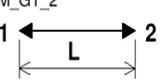
Boundary Conditions

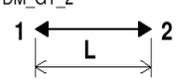
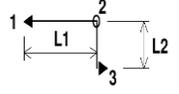
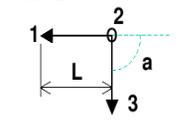
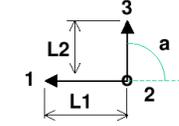
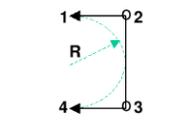
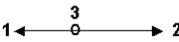
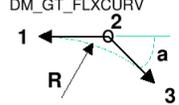
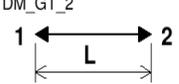
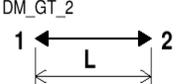
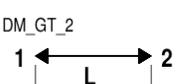
In the current version, the program will “Anchor” the Pipe Ends only when they are connected to a Nozzle otherwise it leaves them as open. On the other hand, if one end of the pipe is connected to another Branch and if that Branch is not included as the part of the Stress model, then the program will also anchor that end automatically.

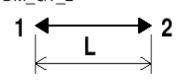
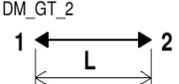
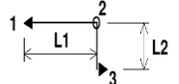
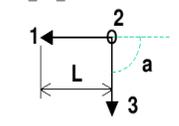
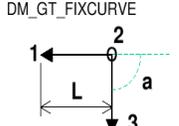
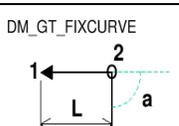
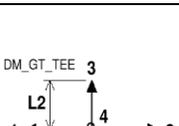
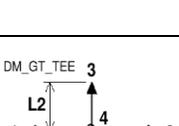
For more clarity, consider the following examples. If one end of the pipe is connected to a Pump Nozzle and the other end is not connected to any equipment nozzle/object, then the program will anchor the first end and leave the other end as free (i.e., do not create any support). On the other hand, if one end of the pipe is connected to a Nozzle and the other end is connected to another Branch and that Branch is not included in the Stress model, then the program will anchor both the ends automatically.

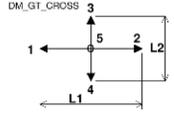
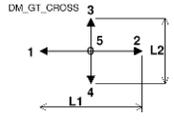
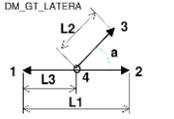
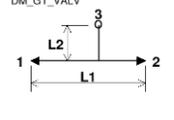
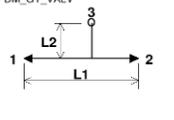
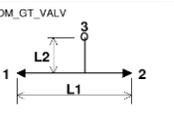
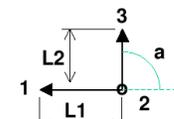
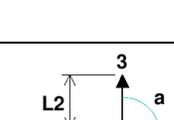
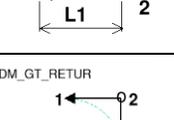
5.0 CADMATIC to CAESAR II Component Mapping

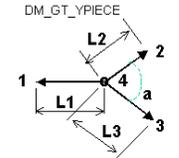
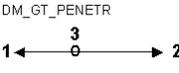
The type of component available in Plant Design is mapped with CAESAR II component and listed below for reference. If the CADAMTIC components meets the GTYPE and the constraints as listed in the table below, then PD2CII translator transfers the component available in Plant Design to CAESAR II as mentioned in the column “CAESAR II Component”.

Plant Design Software Component Description	Constraints	Geometric Types	CAESAR II Component	Key Word in Neutral File
If modeled as Piping Components				
Straight Pipes	DM_GT_PIPE = TRUE & Bend Angle = 0	DM_GT_PIPE 	Pipe	PI
Free Bends	DM_GT_PIPE = TRUE & Bend Angle > 0	DM_GT_PIPE 	Bend	EL
Flexible Curves	DM_GT_FLXCURVE = TRUE	DM_GT_FLXCURV 	Bend	EL
Flanges	DM_GT_2P = True & Primary Connection Code = 1 or 3 (Connection Type is Flange)	DM_GT_2 	Rigid Element or Pipe with Flange	FL
Conc. Reducer	DM_GT_2P = True & 2 nd Nominal Size > 0	DM_GT_2 	Reducer Concentric	RD
Straight Pipes	DM_GT_2P = True & Keyword in corporate catalogue of CADMATIC has “*PIPE*” e.g. Seamless Straight Pipe	DM_GT_2 	Pipe	PI

Plant Design Software Component Description	Constraints	Geometric Types	CAESAR II Component	Key Word in Neutral File
Flow meters, Adaptor, Flexible hoses, Caps	DM_GT_2P = True	DM_GT_2 	Rigid Element	RB
Eccentric Reducer	DM_GT_3PDIRFIX = True		Reducer Eccentric	ER
Fixed Angle Curves	DM_GT_FIXCURVE = True	DM_GT_FIXCURVE 	Bend	EL
Asymmetric Curves	DM_GT_ASYMCURVE = True		Bend	EL
U-Piece	DM_GT_RETURN = True	DM_GT_RETUR 	Bend	EL
Sliding Sockets, Unions	DM_GT_PENETR = True	DM_GT_PENETR 	Rigid Element	RB
If modeled as Standard Components				
Filter / Strainer	DM_GT_FLXCURVE = TRUE	DM_GT_FLXCURV 	Rigid Element	RB
Some Flanges	DM_GT_2P = True & Primary Connection Code = 1 (Connection Type is Flange)	DM_GT_2 	Rigid Element or Pipe with Flange	FL
Straight Pipes	DM_GT_2P = True & Keyword in corporate catalogue of CADMATIC has " **PIPE* " eg Seamless Straight Pipe	DM_GT_2 	Pipe	PI
Valves	DM_GT_2P = True & Keyword in corporate catalogue of CADMATIC has " **VALVE* " eg Ball check valve	DM_GT_2 	Valve	VA

Plant Design Software Component Description	Constraints	Geometric Types	CAESAR II Component	Key Word in Neutral File
	PVC			
Conc. Reducer	DM_GT_2P = True & 2 nd Nominal Size > 0	DM_GT_2 	Reducer Concentric	RD
Flow meters, Adaptor, Flexible hoses	DM_GT_2P = True	DM_GT_2 	Rigid Element	RB
Eccentric Reducer	DM_GT_3PDIRFIX = True		Reducer Eccentric	ER
Fixed Angle Valves	DM_GT_FIXCURVE = True & Keyword in corporate catalogue of CADMATIC has “*VALVE*” eg Pressured rig-valve WDP	DM_GT_FIXCURVE 	Valve	VA
Straight Pipes	DM_GT_FIXCURVE = True & Keyword in corporate catalogue of CADMATIC has “*PIPE*” eg Seamless Straight Pipe	DM_GT_FIXCURVE 	Pipe	PI
Filter / Strainer	DM_GT_FIXCURVE = True	DM_GT_FIXCURVE 	Rigid Element	RB
3 Way Valves	DM_GT_TEE = True & Keyword in corporate catalogue of CADMATIC has “*VALVE*” eg Three-way valve Wafer	DM_GT_TEE 	Three Rigid Elements or Three Pipes with Concentrated Mass	3W
Welding TEE	DM_GT_TEE = True	DM_GT_TEE 	Pipes with Branch SIF (Welding TEE)	TW

Plant Design Software Component Description	Constraints	Geometric Types	CAESAR II Component	Key Word in Neutral File
4 Way Valves	DM_GT_CROSS = True & Keyword in corporate catalogue of CADMATIC has “*VALVE*” eg Four-way valve Wafer		Four Rigid Elements or Four Pipes with Concentrated Mass	4W
Crosses	DM_GT_CROSS = True		Four Pipes with Branch SIF (Welding TEE)	CR
Lateral TEE	DM_GT_LATERAL = True		Pipes with Branch SIF (Welding TEE)	TW
Valves	DM_GT_VALVE = True & Keyword in corporate catalogue of CADMATIC has “*VALVE*” eg Ball Valve		Valve	VA
Reduced Valves	DM_GT_VALVE = True & 2 nd Nominal Size > 0 & Key word in corporate catalogue should not have “*valve*”.		Reducer Concentric	RD
Flow meters, Pressure gauges, Manometers, Strainers	DM_GT_VALVE = True		Rigid Element	RB
Asymmetric Valves	DM_GT_ASYMCURVE = True & Keyword in corporate catalogue of CADMATIC has “*VALVE*” eg Pressured rig-valve WDP		Valve	VA
Asymmetric Curves	DM_GT_ASYMCURVE = True		Bend	EL
U-Piece	DM_GT_RETURN = True		Bend	EL

Plant Design Software Component Description	Constraints	Geometric Types	CAESAR II Component	Key Word in Neutral File
Y-piece	DM_GT_YPIECE = True		Pipes with Branch SIF (Welding TEE)	TW
Sliding Sockets, Unions	DM_GT_PENETR = True		Rigid Element	RB