



Engineering Course



CONTROL DRAWING



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A. CONTROL DRAWING BUILDER (Overview)

The Control Drawing Builder is used to configure the basic control functions of the FCS. With the Control Drawing Builder, operations such as registering function blocks in the drawing file and determining the flow of data between function blocks can be performed graphically.

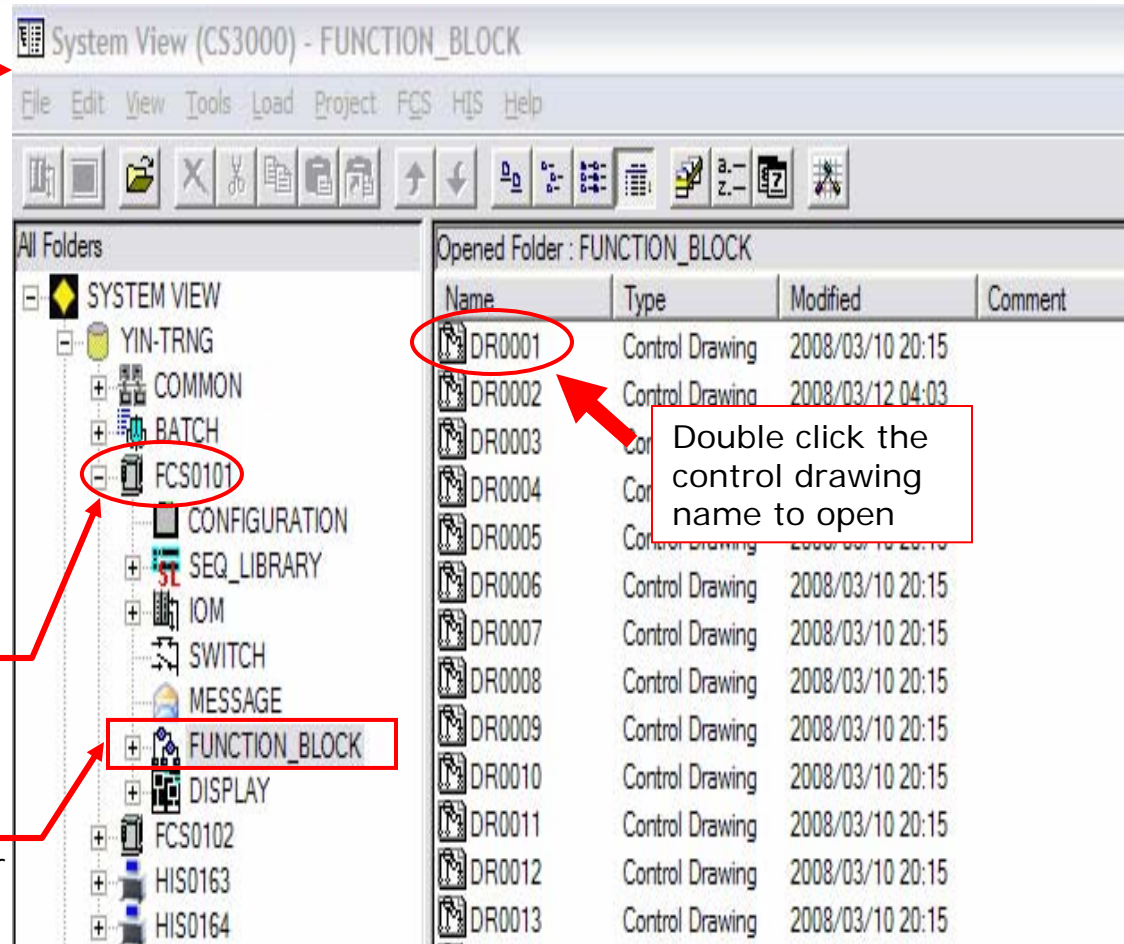
To open the *Control Drawing Builder*, follow this step:

1. Open *System View*.
2. Expand the FCS folder (ex. *FCS0101*).
3. Select / highlight *Function Block* folder.
4. Double click the control drawing shown in the right pane.
The control drawing is shown as *DR0001* up to *DR0200*.

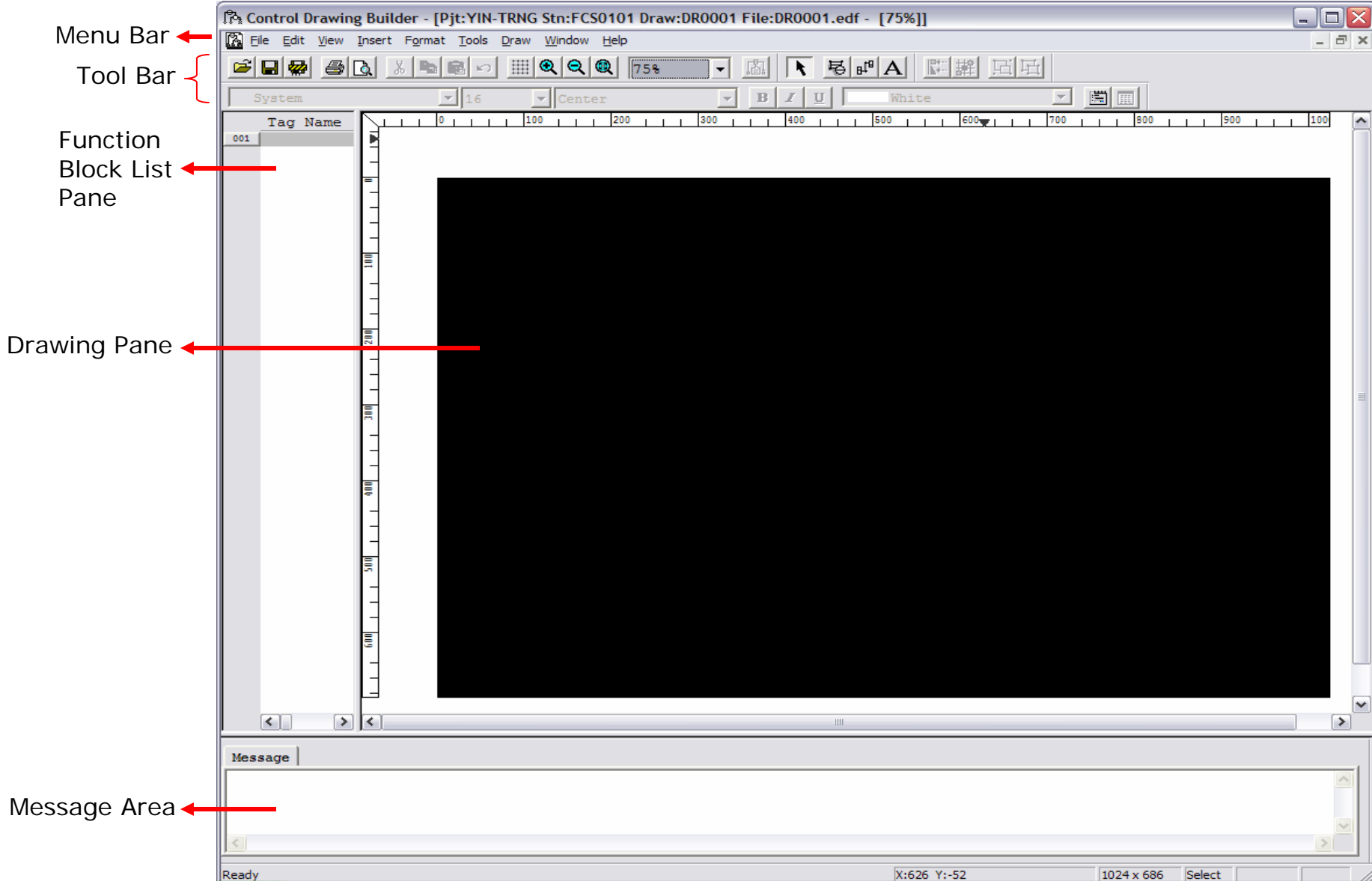
Expand FCS folder

Highlight Function Block folder

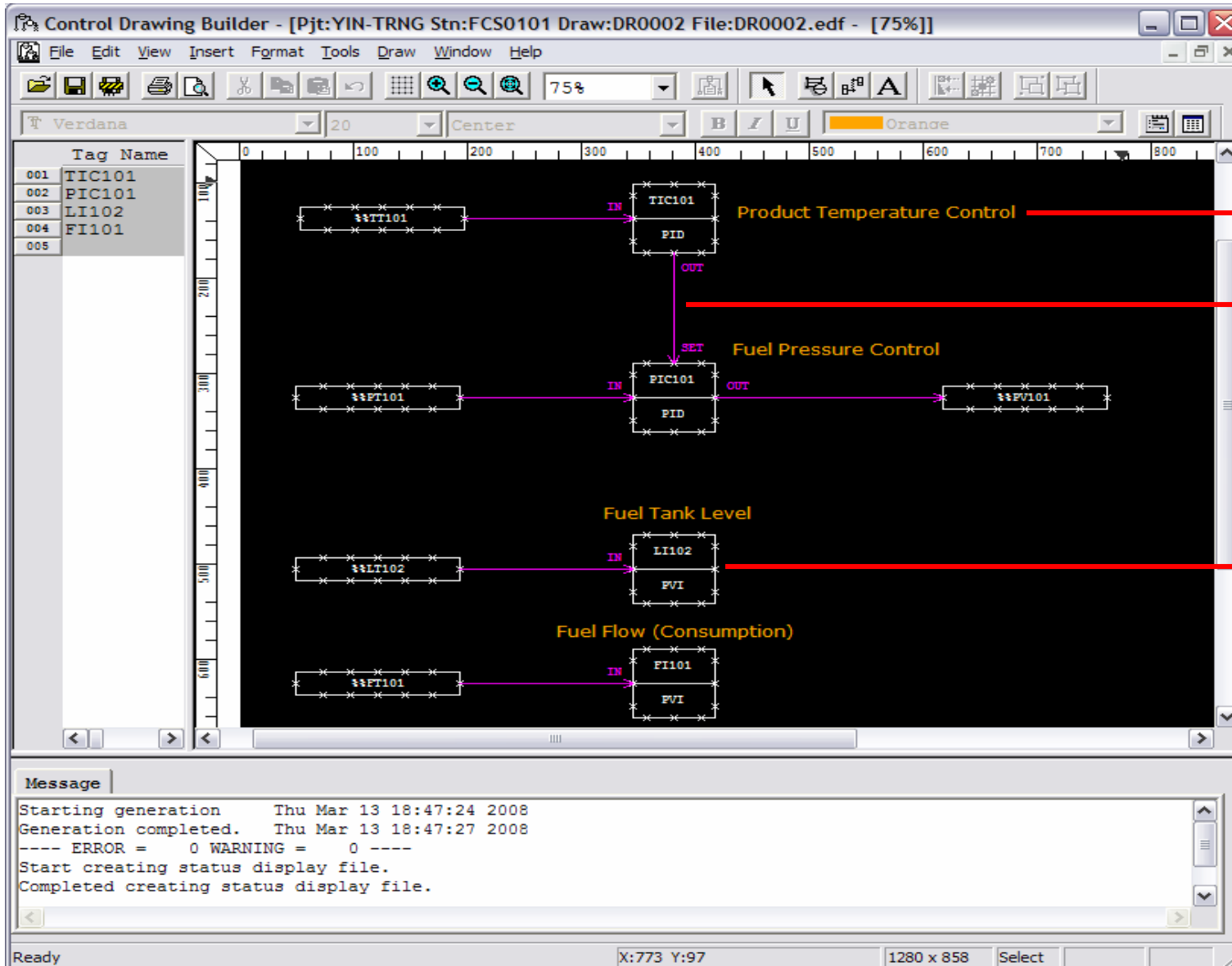
System View



A. CONTROL DRAWING BUILDER (Overview)

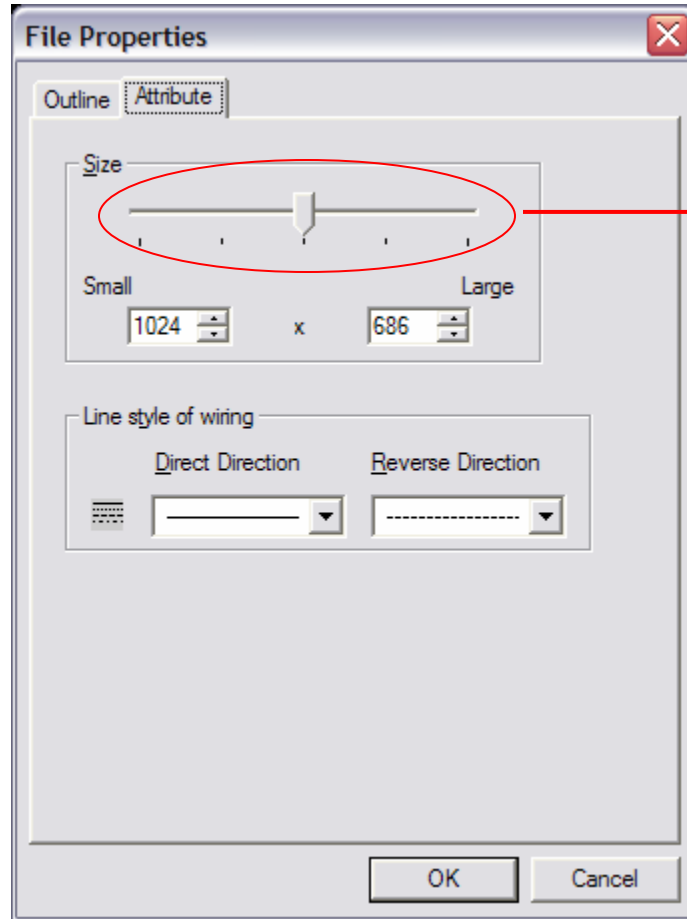
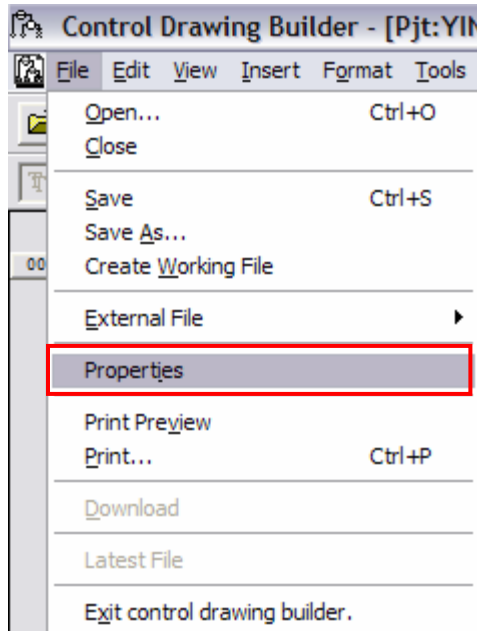


A. CONTROL DRAWING BUILDER (Overview)



A. CONTROL DRAWING BUILDER (Overview)

Changing the size of a control drawing



Slide this control slider to change the size of the control drawing.

A. CONTROL DRAWING BUILDER (Overview)

2. Toolbar Buttons (1/2)



To open a control drawing file (*.sva – “saved as” file).



To save a control drawing file.



To create a working file.



To print a control drawing.



To show print preview.



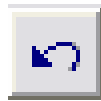
To cut objects in control drawing (function block, text).



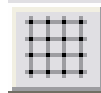
To copy objects in control drawing (function block, text).



To paste objects in control drawing (function block, text).



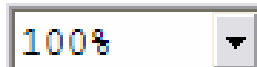
To perform undo operation.



To show or hide grid.



To operate zooming functions.



To change the cursor to selection mode.



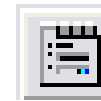
To open function block selection window.



To do soft-wiring operation.



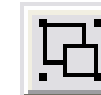
To open detailed parameters of a function block (*Edit Detail*).



To open property of a function block.



To open overview dialog box of control drawing.



To group objects in control drawing.



To ungroup objects in control drawing.

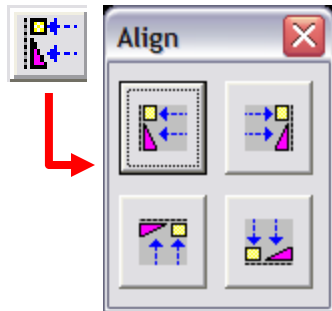
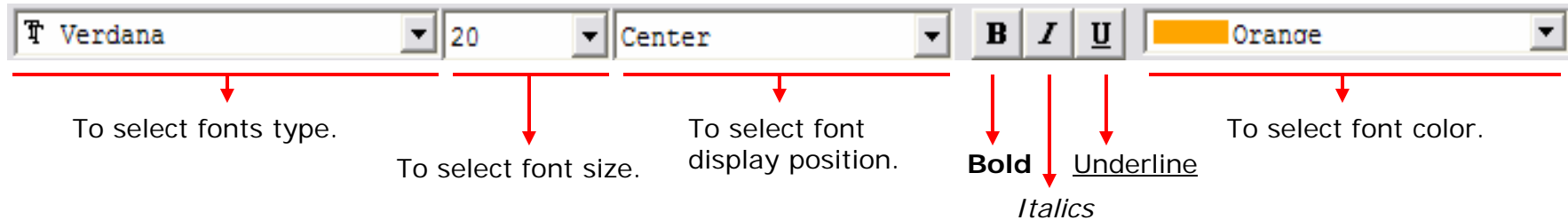


To insert text line.

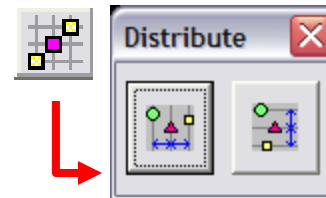
A. CONTROL DRAWING BUILDER (Overview)

2. Toolbar Buttons (2/2)

Text formatting tools:



To perform function blocks position alignment.



To perform function blocks distribution (space alignment)

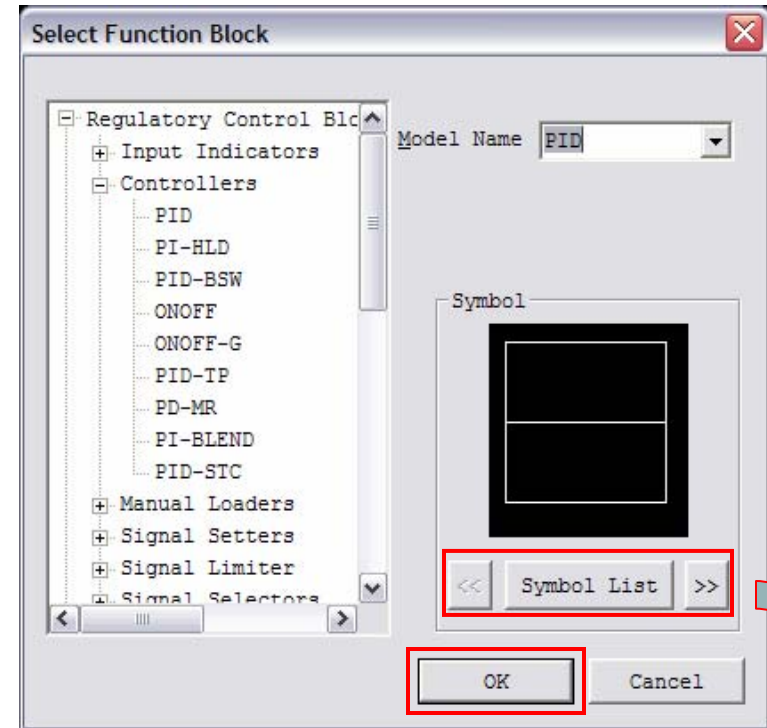
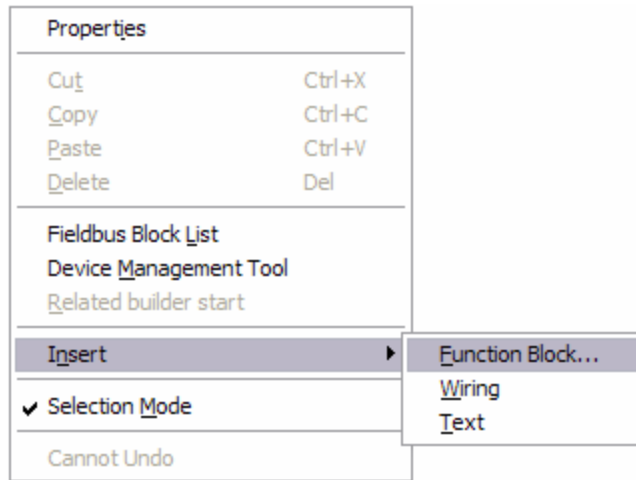
B. CONTROL DRAWING BUILDER (OPERATION)

3. Registering Function Blocks (1/2)

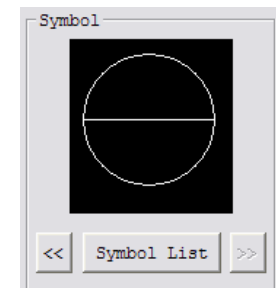


Click this button to open function block selection window.

Or right-click on the control drawing area & select *Function Block...*



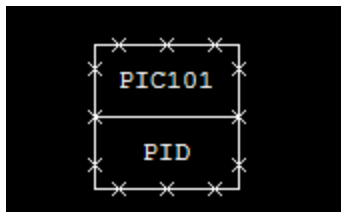
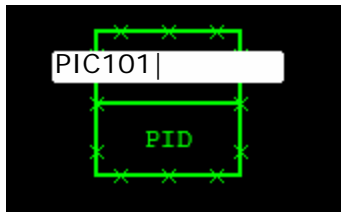
1. Select the function block model from function block category → sub-category → model name. (e.g. *Regulatory Control Blocks* → *Controllers* → *PID*)
If you already know the function block model name, you can directly key in the name in the *Model Name* box.
2. You can select the preferred function block symbol by clicking << or >> or Symbol List button.
3. Click *OK* button.



B. CONTROL DRAWING BUILDER (OPERATION)

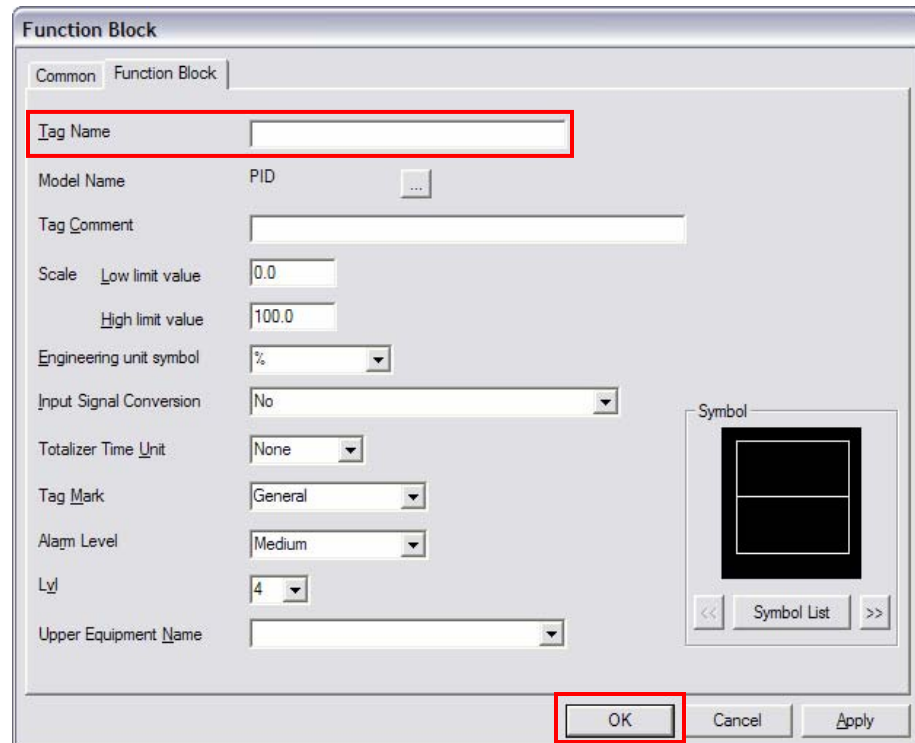
3. Registering Function Blocks (2/2)

Click any point in control drawing area to place the function block. Type its tag number then press [Enter] button.



To change the tag number or if you miss it, do the following:

1. Select the function block (the function block selected will turn green).
2. Click the function block properties button.
3. Type the function block tag name in the *Tag Name* box.
4. Click *OK* button.



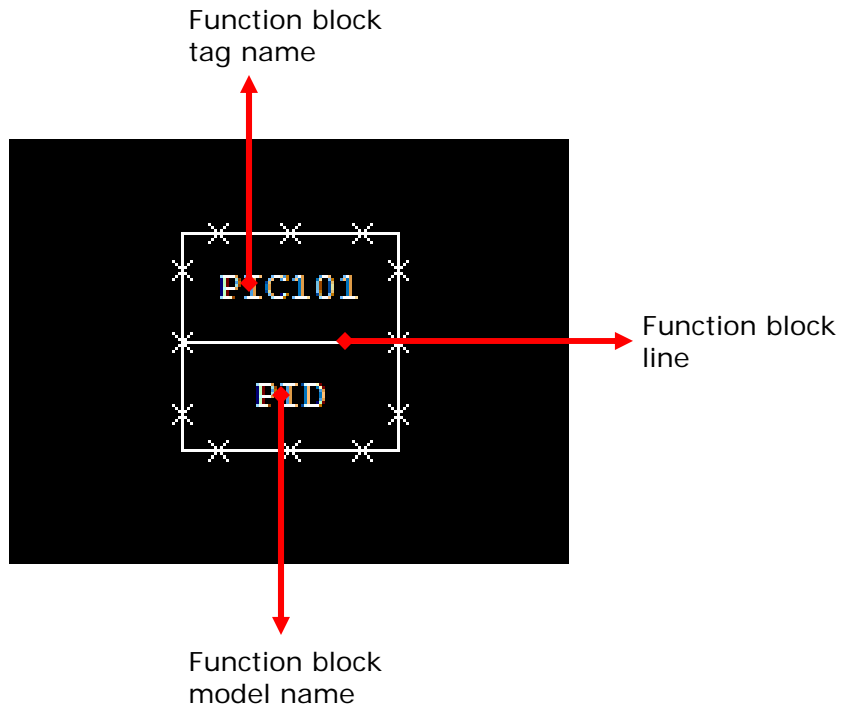
The 'Function Block' dialog box is shown with the 'Common' tab selected. The 'Tag Name' field is highlighted with a red box. The 'Model Name' is set to 'PID'. The 'Tag Comment' field is empty. The 'Scale' section has 'Low limit value' set to 0.0 and 'High limit value' set to 100.0. The 'Engineering unit symbol' is set to '%'. The 'Input Signal Conversion' is set to 'No'. The 'Totalizer Time Unit' is set to 'None'. The 'Tag Mark' is set to 'General'. The 'Alarm Level' is set to 'Medium'. The 'Lvl' is set to 4. The 'Upper Equipment Name' field is empty. The 'OK' button is highlighted with a red box.

B. CONTROL DRAWING BUILDER (OPERATION)

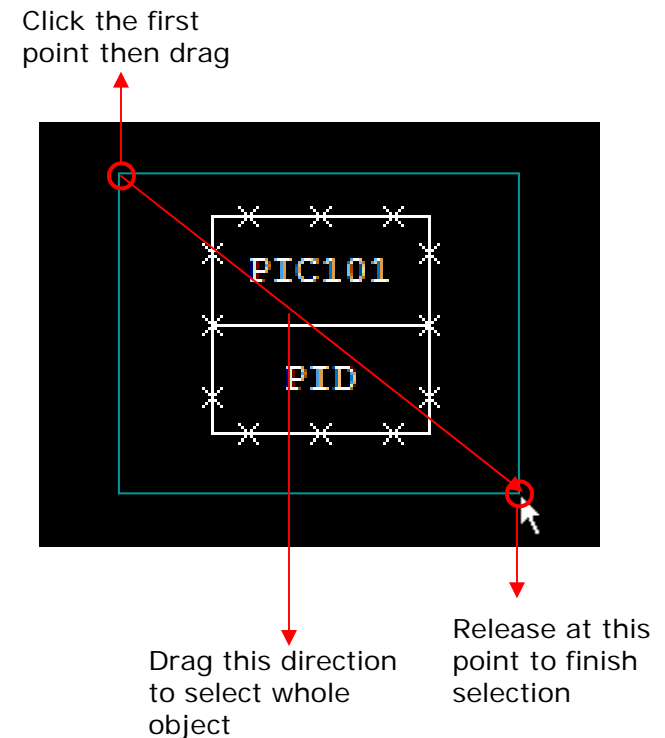
4. Selecting Object (1/2)

To select an object in the control drawing for editing, do one of the following method:

1. Single click on one these function block parts



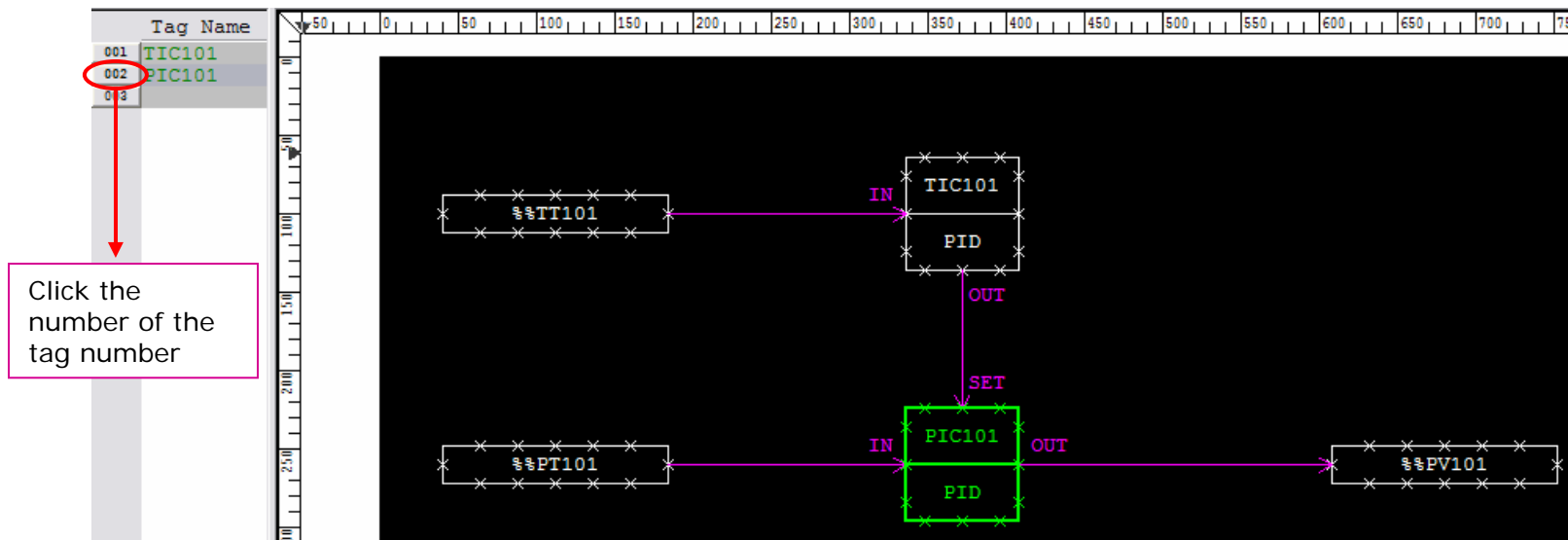
2. Drag the cursor diagonally surrounding the whole object(s)



B. CONTROL DRAWING BUILDER (OPERATION)

4. Selecting Object (2/2)

3. Single click on the function block number from the *Tag Name List Pane*

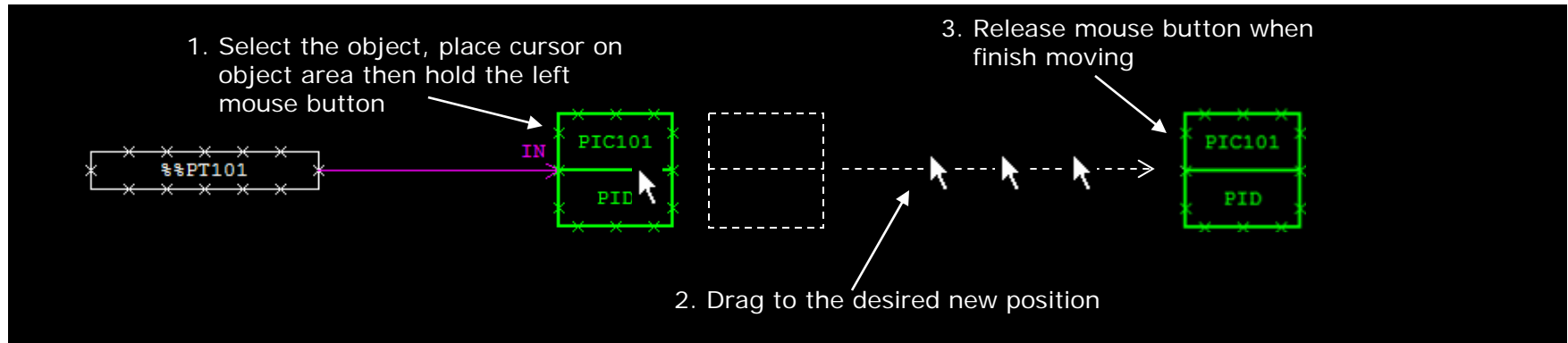


Note: Object turns **green** when selected

5. Moving Object

To move object(s) in the control drawing area:

1. Select the object (objects will turn green when selected).
2. Click on the object area (line, tag name or function block model name) and hold.
3. Drag the object to the new place then release to finish moving.

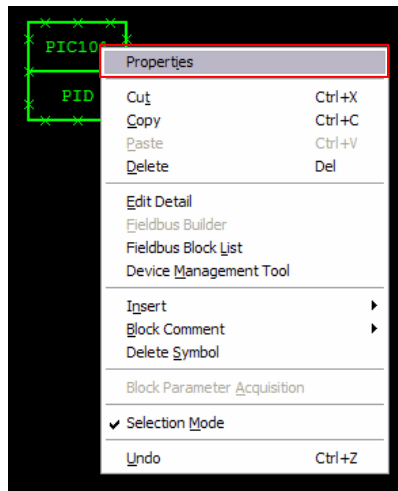


B. CONTROL DRAWING BUILDER (OPERATION)

6. Setting The Parameters Of A Function Block (1/3)

To set **basic** parameters of a function block, do the following:


1. Select the function block (the function block selected will turn green).
2. Click the function block properties button (or right-click on the selected function block then select *Properties*).
3. Function block properties box will open. Fill in / edit the parameters.
4. Click *OK* button when editing is finished.

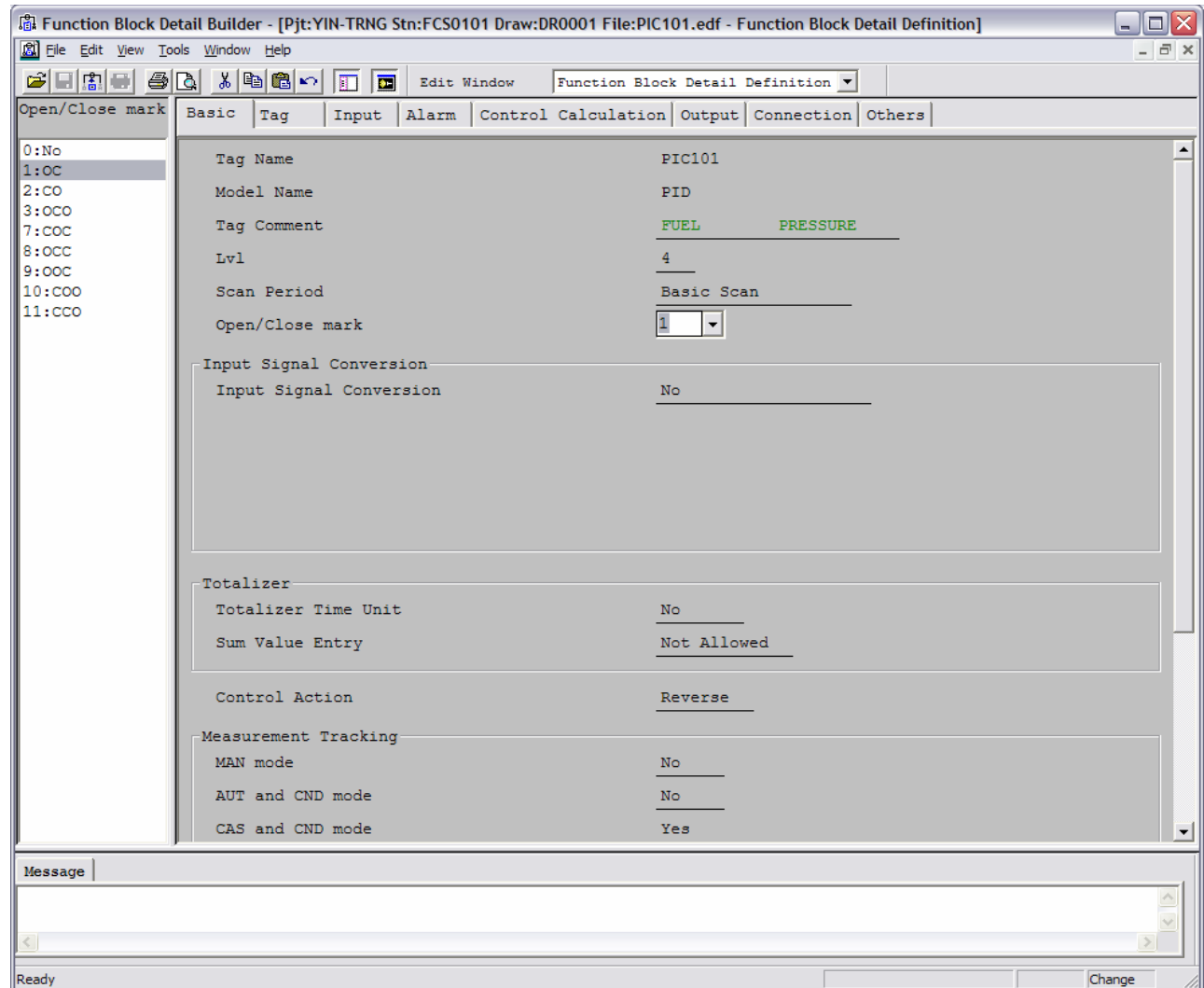
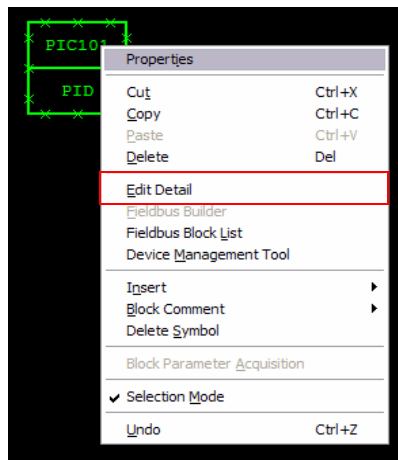
A screenshot of the 'Function Block' properties dialog box. The 'Common' tab is selected. The 'Tag Name' is 'PIC101', 'Model Name' is 'PID', and 'Tag Comment' is 'FUEL PRESSURE'. The 'Scale' section has 'Low limit value' at 0.0 and 'High limit value' at 50.0. The 'Engineering unit symbol' is 'PSI'. 'Input Signal Conversion' is 'No'. 'Totalizer Time Unit' is 'None'. 'Tag Mark' is 'Important with Ack.'. 'Alarm Level' is 'High'. 'Lvl' is '4'. 'Upper Equipment Name' is empty. The 'OK' button is highlighted with a red box. A 'Symbol' preview window is visible on the right.

B. CONTROL DRAWING BUILDER (OPERATION)

6. Setting The Parameters Of A Function Block (2/3)

To set **detailed** parameters of a function block, do the following:

1. Select the function block (the function block selected will turn green).
2. Click the function block edit details button (or right-click on the selected function block then select *Edit Detail*).
3. Function block detailed properties box will open. Fill in / edit the parameters.
4. Click *Update* button when editing is finished. You may exit the editing mode afterwards by clicking  button



B. CONTROL DRAWING BUILDER (OPERATION)

6. Setting The Parameters Of A Function Block (3/3)

Function Block Detail Builder - [Pjt:YIN-TRNG Stn:FCS0101 Draw:DR0001 File:PIC101.edf - Function Block Detail Definition]

File Edit View Tools Window Help

Open/Close mark

0:No
1:OC
2:CO
3:OCO
7:COC
8:OCC
9:OOC
10:COO
11:CCO

Update button

Basic Tag Input Alarm Control Calculation Output Connection Others

Tag Name PIC101
Model Name PID
Tag Comment FUEL PRESSURE
Lvl 4
Scan Period Basic Scan
Open/Close mark 1

Input Signal Conversion
Input Signal Conversion No

Show/Hide Detailed Setting Items button.
Click to show other tabs (when inactive, only Basic tab is displayed).

Note: Only one function block detail builder can be opened at a time from control drawing.

Totalizer
Totalizer Time Unit No
Sum Value Entry Not Allowed

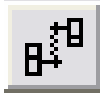
Control Action Reverse

Measurement Tracking
MAN mode No
AUT and CND mode No
CAS and CND mode Yes

Message

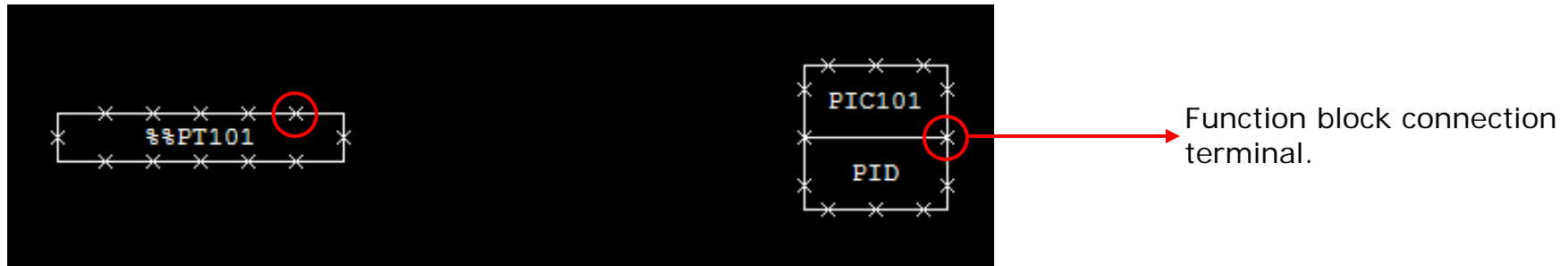
Ready Change

7. Wiring Operation (1/5)



Click this button to perform wiring operation.

Every function block has connection terminals which are denoted by x (cross) marks on the function block symbol lines. To and from this terminals we can interconnect function blocks.



Any connection terminal of a function block can be connected to any terminal of other function block.

To interconnect function blocks by *Auto Wiring* do the following:

1. Click *Wiring* button.
2. Single click on the point of origin terminal then double click on the destination terminal.

To interconnect function blocks by *Manual Wiring* do the following:

1. Click *Wiring* button.
2. Single click on the point of origin terminal, single click the next point(s) then double click on the destination terminal.

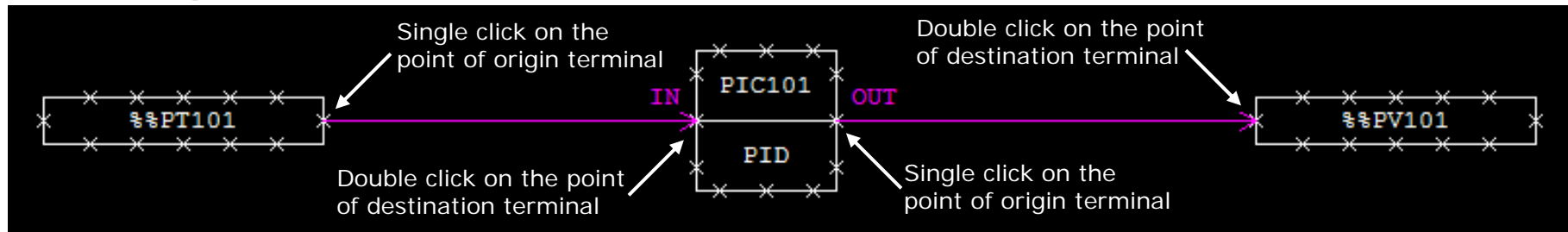
B. CONTROL DRAWING BUILDER (OPERATION)

7. Wiring Operation (2/5)

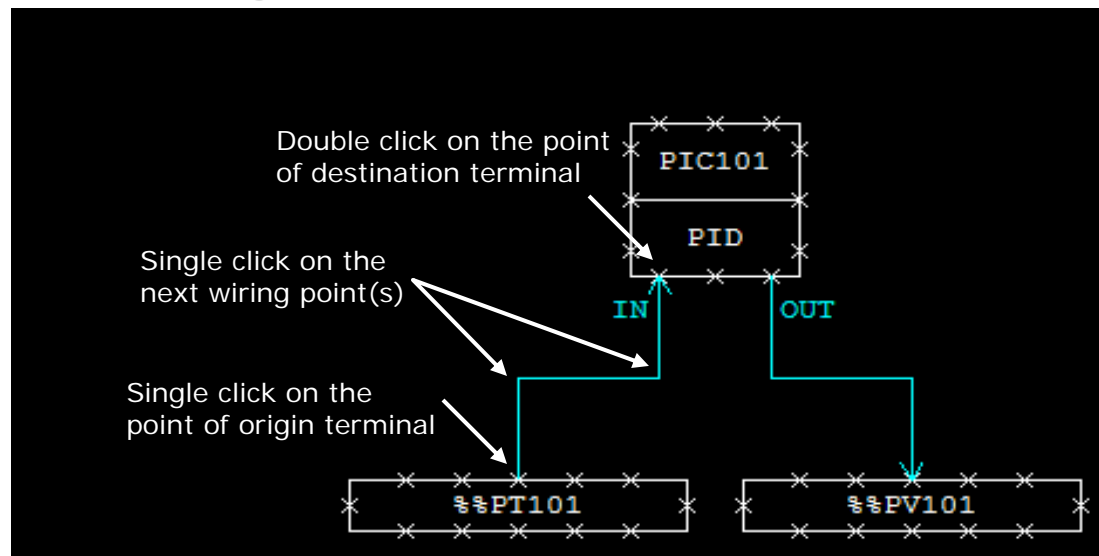


To do soft-wiring operation.

Auto Wiring



Manual Wiring

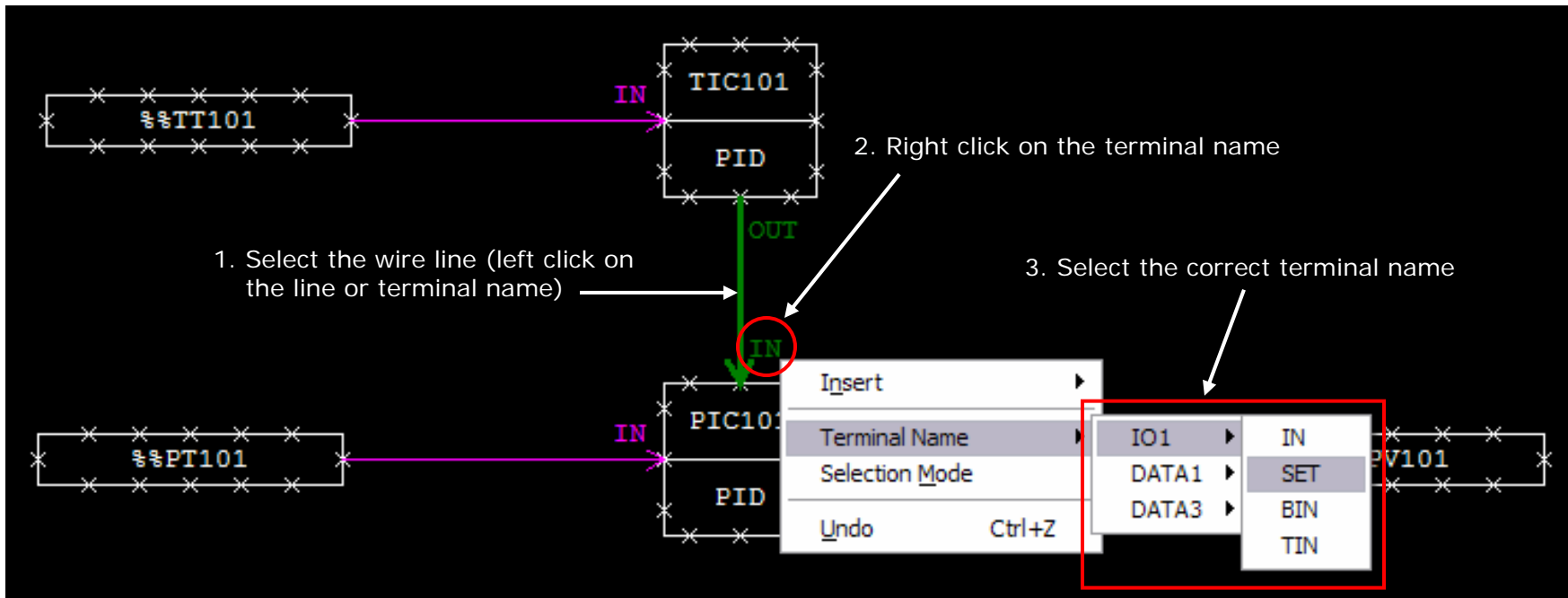


Legend

- : Auto wiring
- : Manual wiring

7. Wiring Operation (3/5)

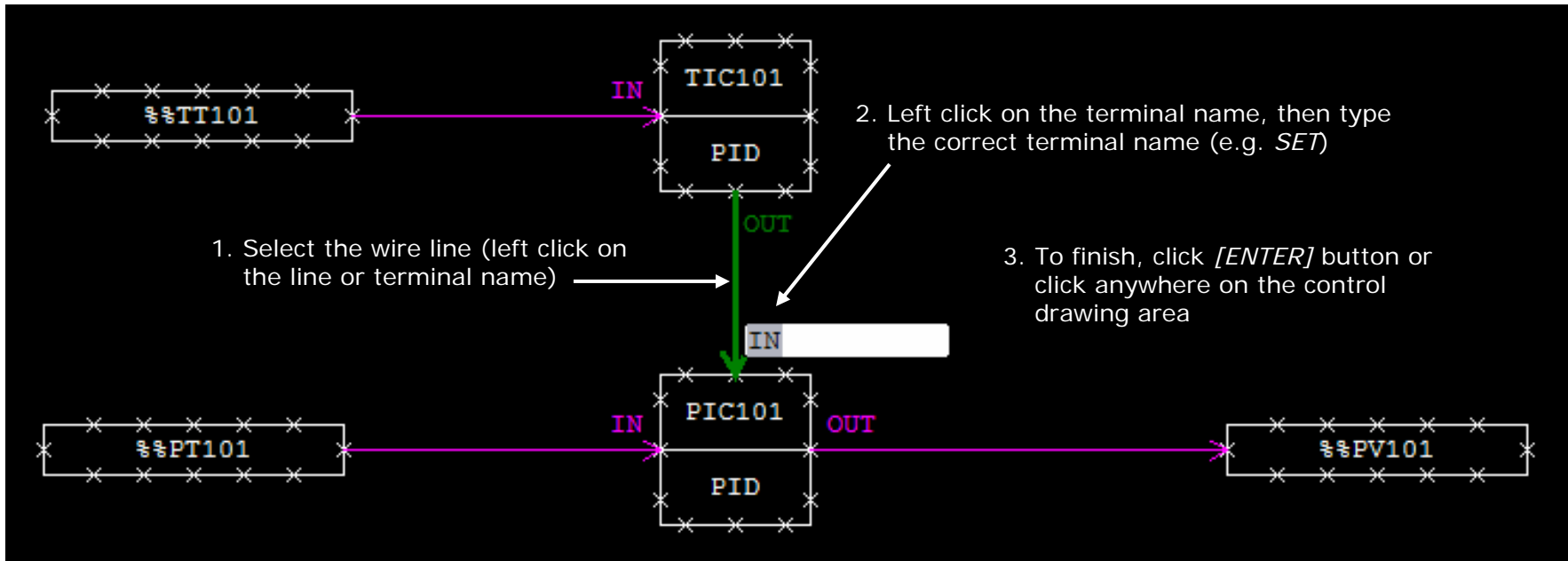
Changing Terminal Name (Method 1)



Note:
The soft-wire / terminal turns green when selected.

7. Wiring Operation (4/5)

Changing Terminal Name (Method 2)

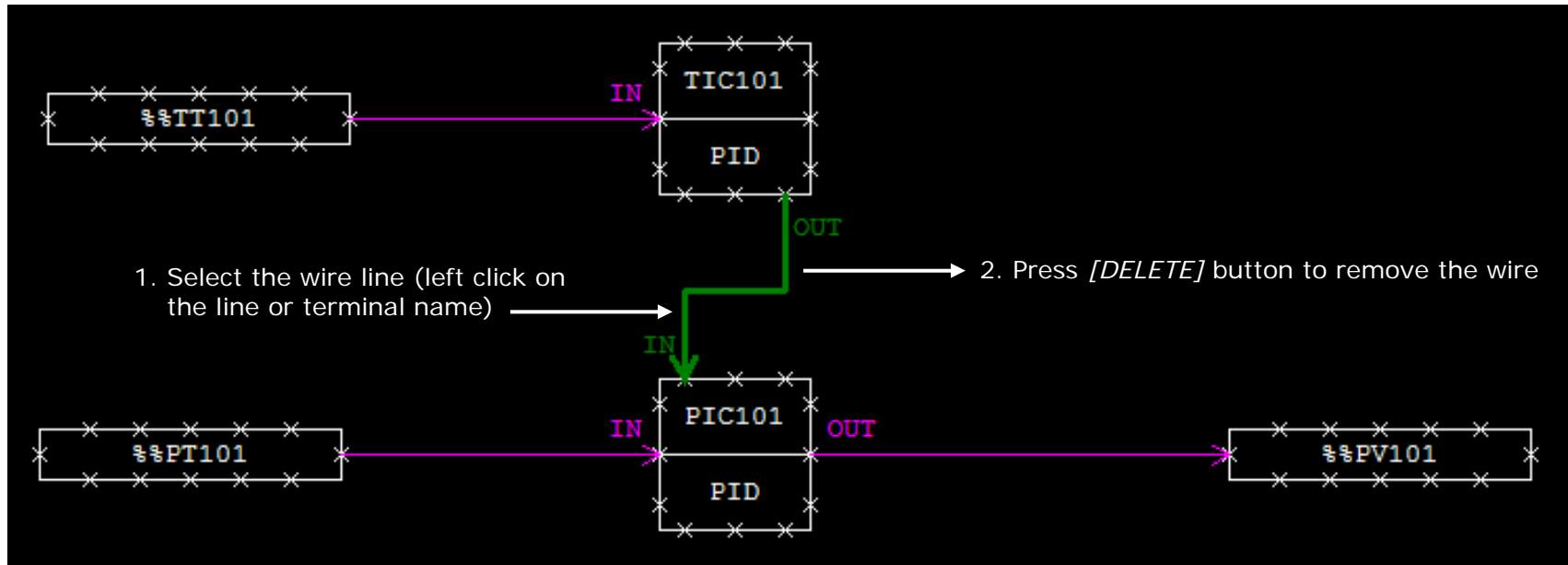


Note:

The soft-wire / terminal turns green when selected.

7.Wiring Operation (5/5)

Deleting Line



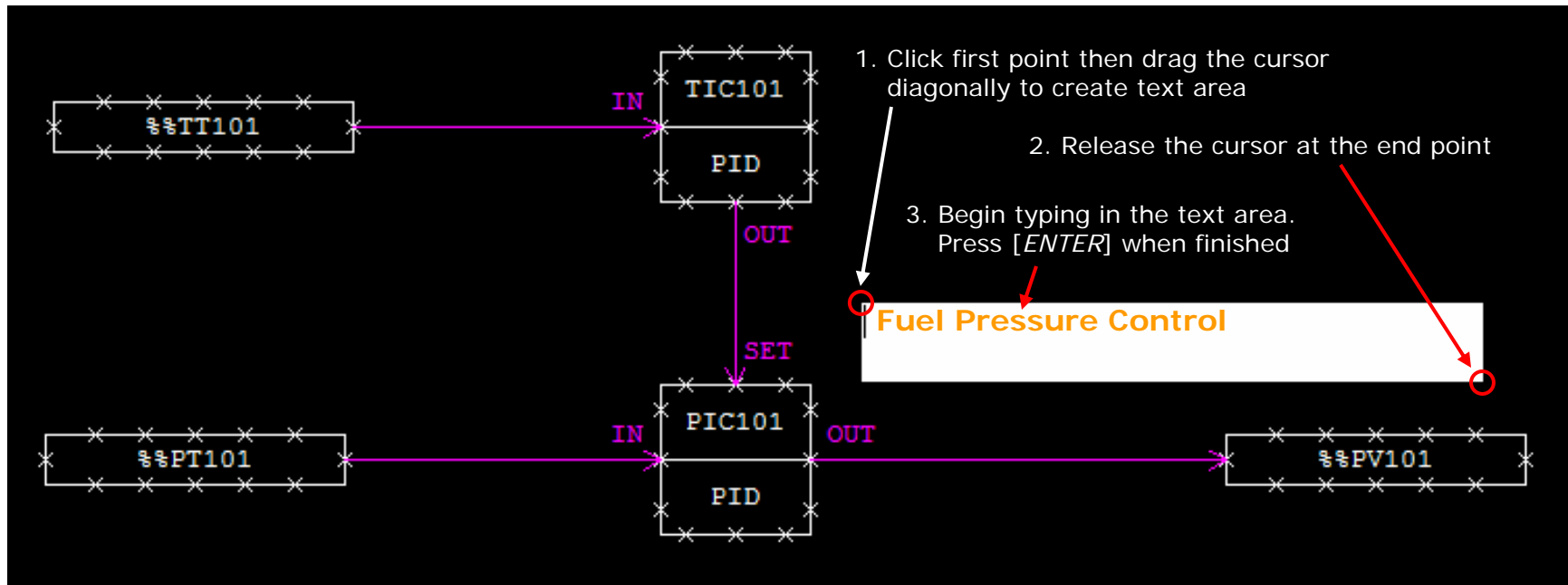
Note:
The soft-wire / terminal turns green when selected.

B. CONTROL DRAWING BUILDER (OPERATION)

8. Text Editing In Control Drawing (1/3)



Click this button to insert text line in the control drawing.



Note: Use text formatting tool to format the text for color, size, font type, etc)

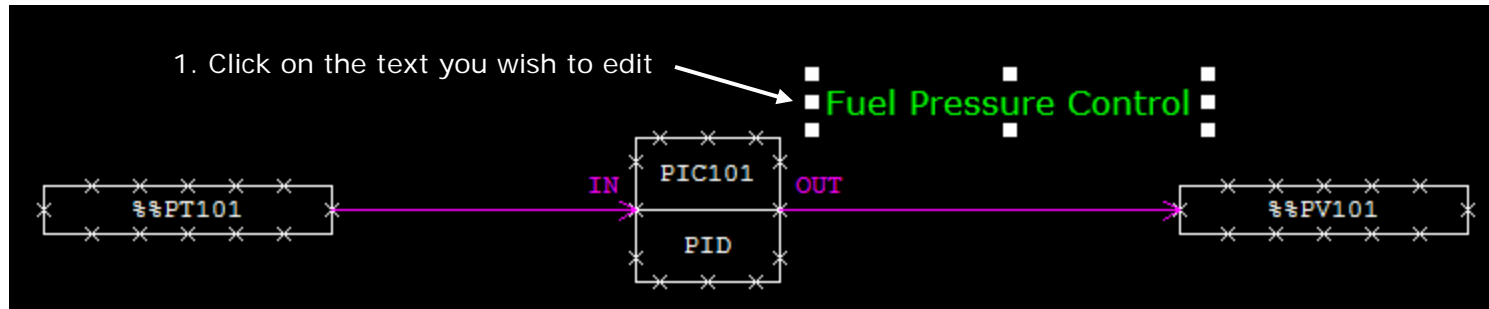


B. CONTROL DRAWING BUILDER (OPERATION)

8. Text Editing In Control Drawing (2/3)

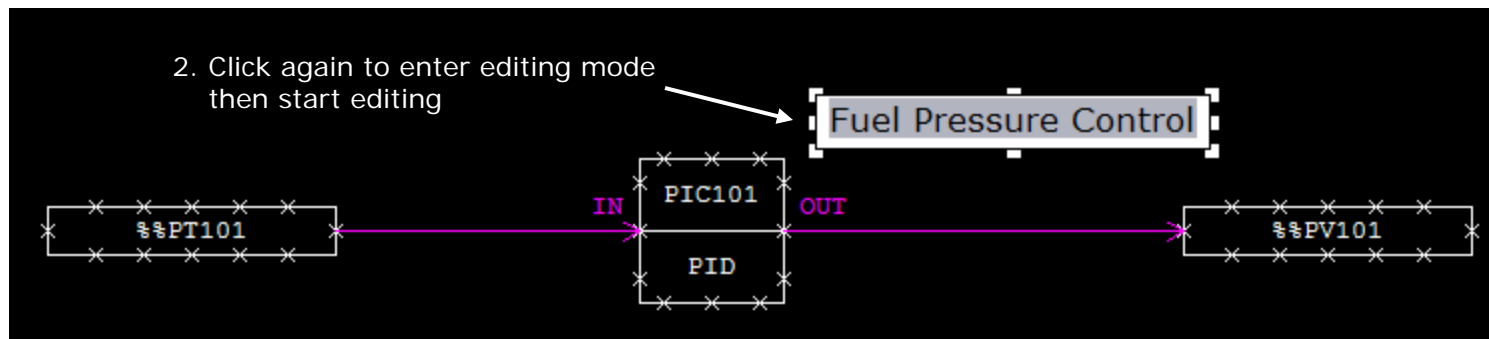
To edit a text line, do two-step click:

1. Click on the text you want to edit.
2. Once again click on it.
3. Text line will be changed to editing mode. You may start editing the text. When finished, press [ENTER] button.



Note:

Two-step click is no double click!



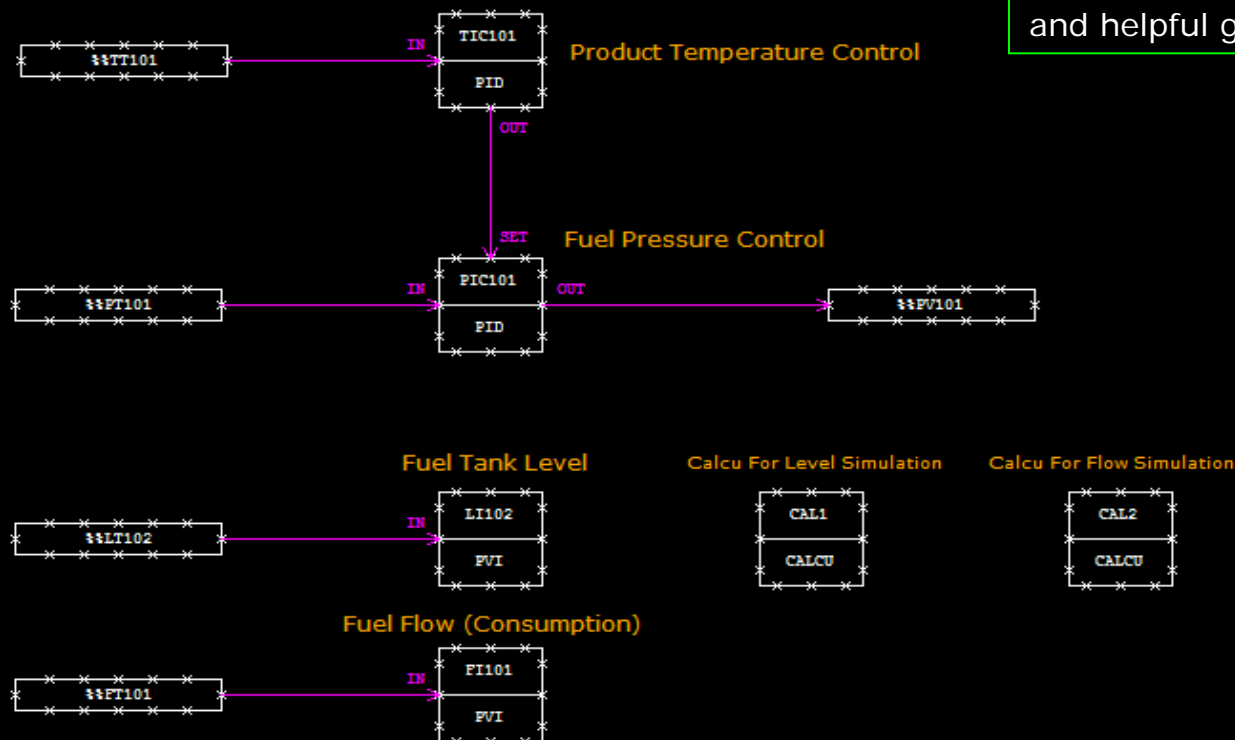
B. CONTROL DRAWING BUILDER (OPERATION)

8. Text Editing In Control Drawing (3/3)

- FURNACE CONTROL (H-101) -

Note:

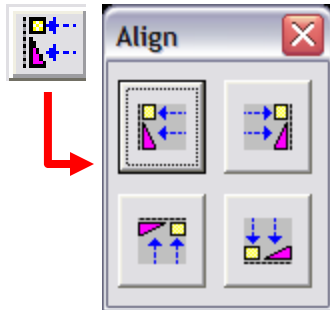
It is a good engineering practice to provide control descriptive text in the control drawing for ease of maintenance and helpful guide.



Created by : Gatot Sugiarto
Revision : 0
Date : 10 April 2006

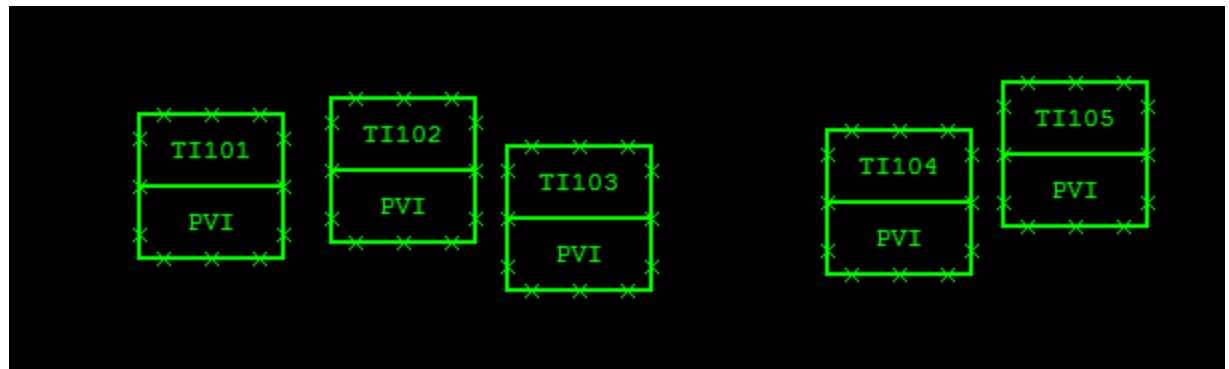
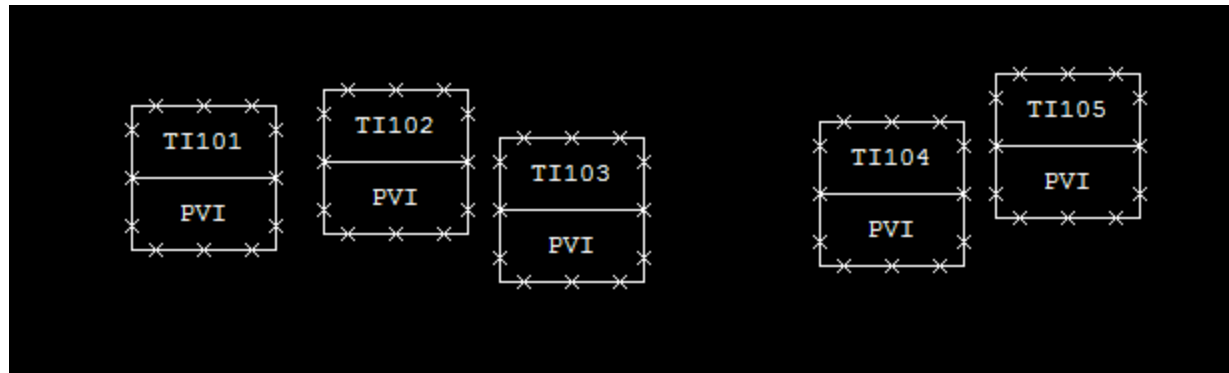
B. CONTROL DRAWING BUILDER (OPERATION)

9. Aligning Objects In Control Drawing (1/3)



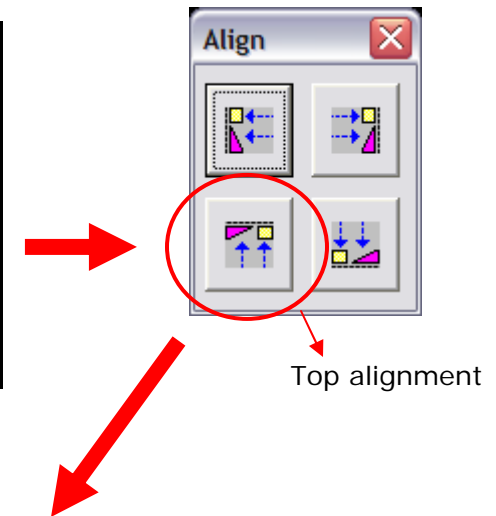
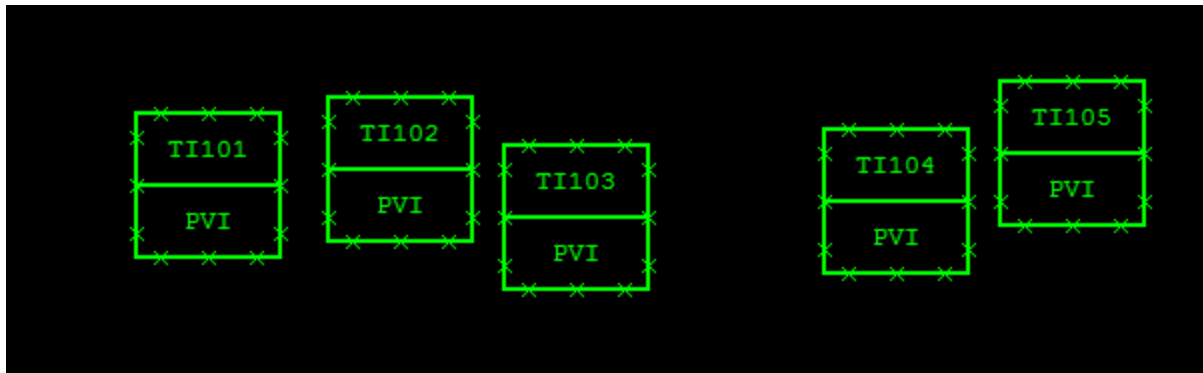
Click these buttons to perform function blocks position alignment.

1. Select a group of function blocks to align.
2. Click the align button.
3. From the group of align button that pops up click the alignment orientation button.



B. CONTROL DRAWING BUILDER (OPERATION)

9. Aligning Objects In Control Drawing (2/3)



B. CONTROL DRAWING BUILDER (OPERATION)

9. Aligning Objects In Control Drawing (3/3)

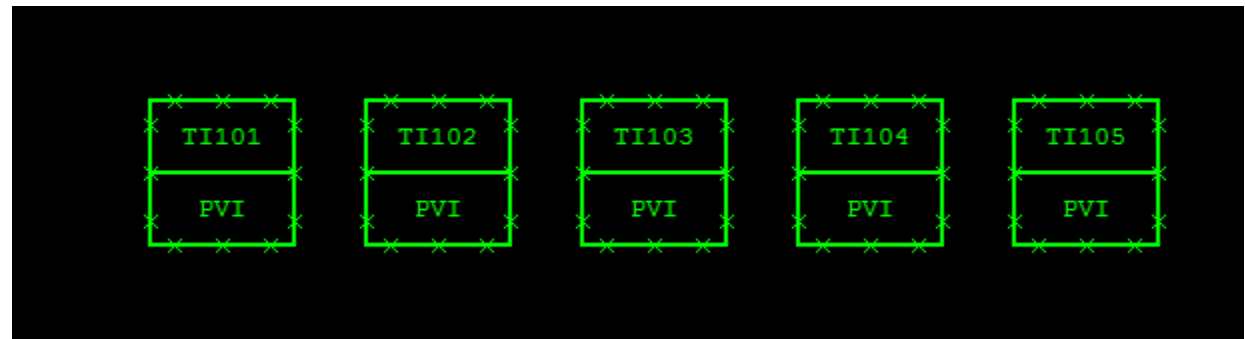
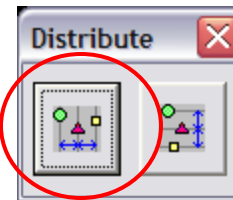


Click this button to perform function blocks distribution (space alignment)

1. Select a group of function blocks to distribute.
2. Click the distribute button.
3. From the group of distribute button that pops up click the alignment orientation button.



Horizontal distribution

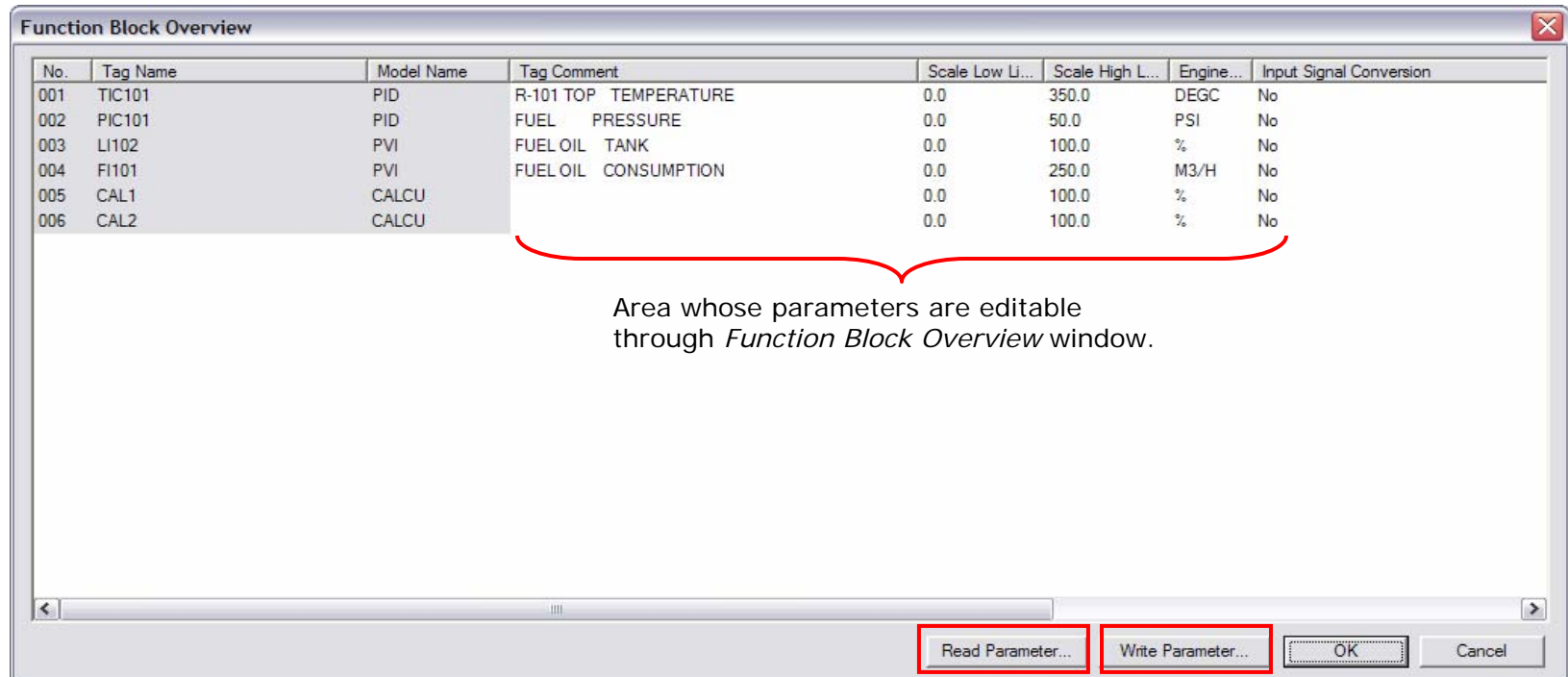


B. CONTROL DRAWING BUILDER (OPERATION)

10. Function Block Overview Dialog



Click this button to open overview dialog box of control drawing.



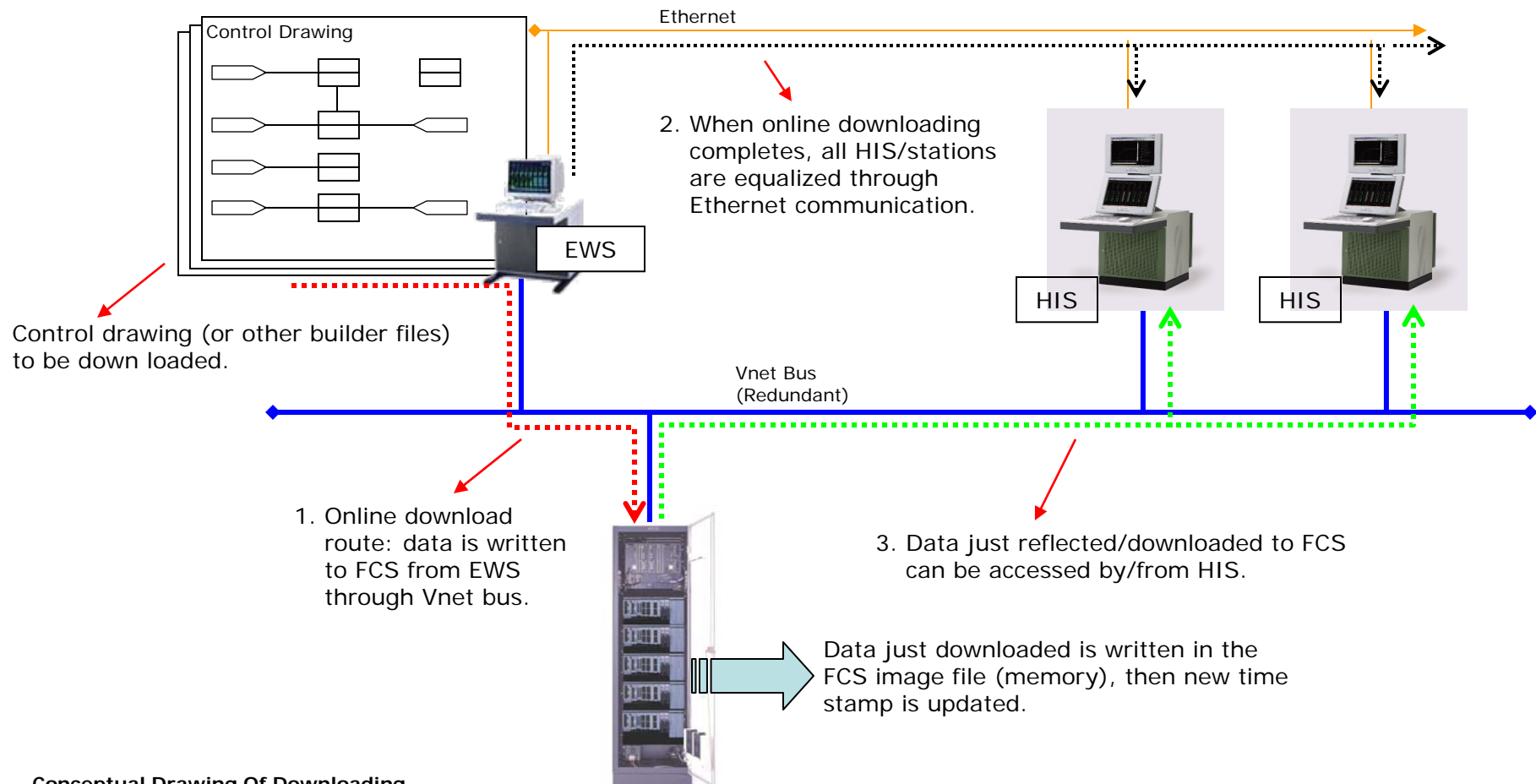
Clicking this button will import parameters from a file (to replace the existing parameters with those of the file [*.csv]).

Clicking this button will export the existing parameters to a *.csv file.

B. CONTROL DRAWING BUILDER (OPERATION)

11. Online Downloading The Control Strategy Into FCS (1/4)

Any changes made in the control drawing builder will not take effect until it is reflected to FCS by downloading. Most of downloading can be done on-line (i.e. without interrupting control being performed by FCS).



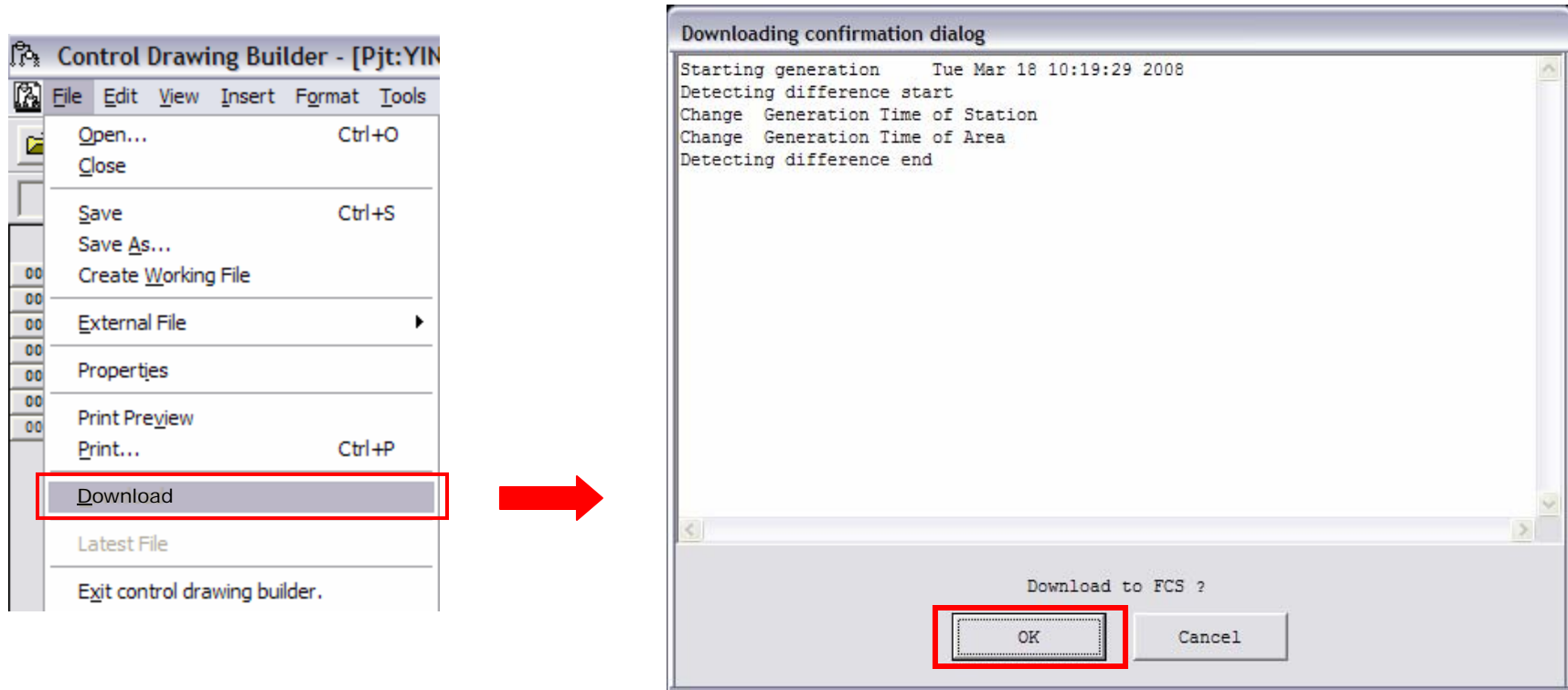
Conceptual Drawing Of Downloading

B. CONTROL DRAWING BUILDER (OPERATION)

11. Online Downloading The Control Strategy Into FCS (2/4)

Do these step to perform online downloading of control drawing.

1. From the control drawing menu bar, click File.
Click Download from the pull down menu.
2. Click *OK* button of the downloading confirmation dialog window to proceed with downloading process.



B. CONTROL DRAWING BUILDER (OPERATION)

11. Online Downloading The Control Strategy Into FCS (3/4)

The screenshot displays the 'Control Drawing Builder' software window. The title bar indicates the project is '[Pjt:YIN-TRNG Stn:FCS0101 Draw:DR0002 File:DR0002.edf - [75%]]'. The interface includes a menu bar (File, Edit, View, Insert, Format, Tools, Draw, Window, Help), a toolbar with various drawing tools, and a status bar at the bottom showing 'Ready', 'X:912 Y:-58', and '1280 x 858 Select'.

On the left, a 'Tag Name' list contains the following entries:

Tag Name
001 TIC101
002 PIC101
003 LI102
004 FI101
005 CAL1
006 CAL2
007

The main drawing area, titled '- FURNACE CONTROL (H-101) -', shows a control strategy diagram. It includes two PID controllers: 'TIC101' (Product Temperature Control) and 'PIC101' (Fuel Pressure Control). The diagram shows a feedback loop where the output of the PIC101 is fed back to the TIC101. The diagram also shows a feedforward path from a 'TIC101' block to the 'PIC101' block. The diagram is titled '- FURNACE CONTROL (H-101) -'.

At the bottom, the 'Message' window displays the following text:

```
Generation completed. Tue Mar 18 10:21:05 2008
Equalize start. HIS0164
Equalize completed successfully. HIS0164
---- ERROR = 0 WARNING = 0 ----
Start creating status display file.
Start Equalize HIS0164
Completed Equalize Normally
Completed creating status display file.
---- ERROR = 0 WARNING = 0 ----
```

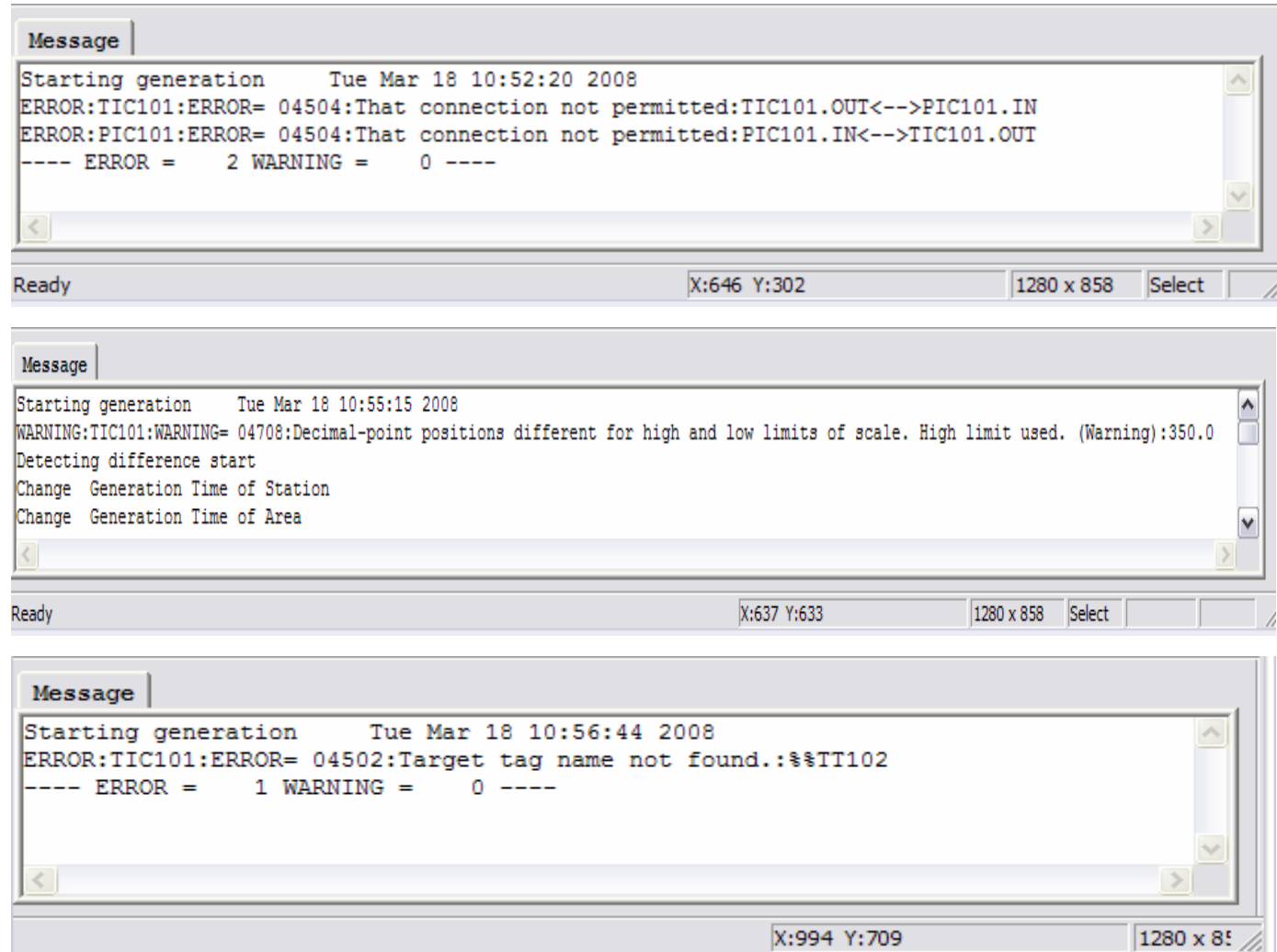
A red box highlights the message window, and a red arrow points to it with the text 'Example of successful downloading'.

Observe the message area of the control drawing. A successful downloading will not return error message(s). Should there be any error, look into the error message to resolve the problem.

B. CONTROL DRAWING BUILDER (OPERATION)

11. Online Downloading The Control Strategy Into FCS (4/4)

On the right hand side are example of error or warning message generated during downloading process.



C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
Input Indicator Block	PVI	Input Indicator Block
	PVI-DV	Input Indicator Block with Deviation Alarm
Controller Block	PID	PID Controller Block
	PI-HLD	Sampling PI Controller Block
	PID-BSW	PID Controller Block with Batch Switch
	ONOFF	Two-Position ON/OFF Controller Block
	ONOFF-E	Enhanced Two-Position ON/OFF Controller Block (*1)
	ONOFF-G	Three-Position ON/OFF Controller Block
	ONOFF-GE	Enhanced Three-Position ON/OFF Controller Block (*1)
	PID-TP	Time-Proportioning ON/OFF Controller Block
	PD-MR	PD Controller Block with Manual Reset
	PI-BLEND	Blending PI Controller Block
	PID-STC	Self-Tuning PID Controller Block
Manual Loader Block	MLD	Manual Loader Block
	MLD-PVI	Manual Loader Block with Input Indicator
	MLD-SW	Manual Loader Block with Auto/Man SW
	MC-2	Two-Position Motor Control Block
	MC-2E	Enhanced Two-Position Motor Control Block (*1)
	MC-3	Three-Position Motor Control Block
	MC-3E	Enhanced Three-Position Motor Control Block (*1)
Signal Setter Block	RATIO	Ratio Set Block
	PG-L13	13-Zone Program Set Block
	BSETU-2	Flow-Totalizing Batch Set Block
	BSETU-3	Weight-Totalizing Batch Set Block
Signal Limiter Block	VELLIM	Velocity Limiter Block
Signal Selector Block	SS-H/M/L	Signal Selector Block
	AS-H/M/L	Auto-Selector Block
	SS-DUAL	Dual-Redundant Signal Selector Block
Signal Distributor Block	FOUT	Cascade Signal Distributor Block
	FFSUM	Feed-Forward Signal Summing Block
	XCPL	Non-Interference Control Output Block
	SPLIT	Control Signal Splitter Block
Alarm Block	ALM-R	Representative Alarm Block
Pulse Count Input Block	PTC	Pulse Count Input Block

C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
YS Instrument Block	SLCD	YS Controller Block
	SLPC	YS Programmable Controller Block
	SLMC	YS Programmable Controller Block with Pulse-Width Output
	SMST-111	YS Manual Station Block with SV Output
	SMST-121	YS Manual Station Block with MV Output Lever
	SMRT	YS Ratio Set Station Block
	SBSD	YS Batch Set Station Block
	SLCC	YS Blending Controller Block
	SLBC	YS Batch Controller Block
	STLD	YS Totalizer Block
FOUNDATION fieldbus Faceplate Block (*2)	FF-AI	FOUNDATION fieldbus Analog Input Block
	FF-DI	FOUNDATION fieldbus Discrete Input Block
	FF-CS	FOUNDATION fieldbus Control Selector Block
	FF-PID	FOUNDATION fieldbus PID Control Block
	FF-RA	FOUNDATION fieldbus Ratio Block
	FF-AO	FOUNDATION fieldbus Analog Output Block
	FF-DO	FOUNDATION fieldbus Discrete Output Block
	FF-OS	FOUNDATION fieldbus Output Splitter Block
	FF-SC	FOUNDATION fieldbus Signal Characterizer (Totalizer) Block
	FF-IT	FOUNDATION fieldbus Integrator Block
	FF-IS	FOUNDATION fieldbus Input Selector Block
	FF-MDI	FOUNDATION fieldbus Multiple Discrete Input Block
	FF-MDO	FOUNDATION fieldbus Multiple Discrete Output Block
	FF-MAI	FOUNDATION fieldbus Multiple Analog Input Block
	FF-MAO	FOUNDATION fieldbus Multiple Analog Output Block
	FF-SUNV	Simple Universal Block

C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
Arithmetic Calculation Block	ADD	Addition Block
	MUL	Multiplication Block
	DIV	Division Block
	AVE	Averaging Block
Analog Calculation Block	SQRT	Square Root Block
	EXP	Exponential Block
	LAG	First-Order Lag Block
	INTEG	Integration Block
	LD	Derivative Block
	RAMP	Ramp Block
	LDLAG	Lead/Lag Block
	DLAY	Dead-Time Block
	DLAY-C	Dead-Time Compensation Block
	AVE-M	Moving-Average Block
	AVE-C	Cumulative-Average Block
	FUNC-VAR	Variable Line-Segment Function Block
	TPCFL	Temperature and Pressure Correction Block
	ASTM1	ASTM Correction Block: Old JIS
	ASTM2	ASTM Correction Block: New JIS

Logic Operation Block (*1)

AND	Logical AND Block
OR	Logical OR Block
NOT	Logical NOT Block
SRS1-S	Set-Dominant Flip-Flop Block with 1 Output
SRS1-R	Reset-Dominant Flip-Flop Block with 1 Output
SRS2-S	Set-Dominant Flip-Flop Block with 2 Output
SRS2-R	Reset-Dominant Flip-Flop Block with 2 Output
WOUT	Wipeout Block
OND	ON-Delay Timer Block
OFFD	OFF-Delay Timer Block
TON	One-Shot Block (rising-edge trigger)
TOFF	One-Shot Block (falling-edge trigger)
GT	Comparator Block (greater than)
GE	Comparator Block (greater than or equal)
EQ	Equal Operator Block
BAND	Bitwise AND Block
BOR	Bitwise OR Block
BNOT	Bitwise NOT Block

C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
Sequence Table Block	ST16	Sequence Table Block
	ST16E	Rule Extension Block
Logic Chart Block	LC64	Logic Chart Block
SFC Block	_SFC SW	3-Position Switch SFC Block
	_SFC PB	Pushbutton SFC Block
	_SFC AS	Analog SFC Block
Switch Instrument Block	SI-1	Switch Instrument Block with 1 Input
	SI-2	Switch Instrument Block with 2 Inputs
	SO-1	Switch Instrument Block with 1 Output
	SO-2	Switch Instrument Block with 2 Outputs
	SIO-11	Switch Instrument Block with 1 Input and 1 Output
	SIO-12	Switch Instrument Block with 1 Input and 2 Outputs
	SIO-21	Switch Instrument Block with 2 Inputs and 1 Output
	SIO-22	Switch Instrument Block with 2 Inputs and 2 Outputs
	SIO-12P	Switch Instrument Block with 1 Input, 2 One-Shot Outputs
	SIO-22P	Switch Instrument Block with 2 Inputs, 2 One-Shot Outputs
	SI-1E	Enhanced Switch Instrument Block with 1 Input (*1)
	SI-2E	Enhanced Switch Instrument Block with 2 Inputs (*1)
	SO-1E	Enhanced Switch Instrument Block with 1 Output (*1)
	SO-2E	Enhanced Switch Instrument Block with 2 Outputs (*1)
	SIO-11E	Enhanced Switch Instrument Block with 1 Input and 1 Output (*1)
	SIO-12E	Enhanced Switch Instrument Block with 1 Input and 2 Outputs (*1)
	SIO-21E	Enhanced Switch Instrument Block with 2 Inputs and 1 Output (*1)
	SIO-22E	Enhanced Switch Instrument Block with 2 Inputs and 2 Outputs (*1)
	SIO-12PE	Enhanced Switch Instrument Block with 1 Input, 2 One-Shot Outputs (*1)
	SIO-22PE	Enhanced Switch Instrument Block with 2 Inputs, 2 One-Shot Outputs (*1)

Sequence Auxiliary Block	TM	Timer Block
	CTS	Software Counter Block
	CTP	Pulse Train Input Counter Block
	CI	Code Input Block
	CO	Code Output Block
	RL	Relational Expression Block
Valve Monitoring Block	RS	Resource Scheduler Block
	VLVM	Valve Monitoring Block

C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
Analog Faceplate Block	INDST2	Dual-Pointer Indicating Station Block
	INDST2S	Dual-Pointer Manual Station Block
	INDST3	Triple-Pointer Manual Station Block
Sequence Faceplate Block	BSI	Batch Status Indicator Block
	PBS5C	Extended 5-Pushbutton Switch Block
	PBS10C	Extended 10-Pushbutton Switch Block (*1)
Hybrid Faceplate Block	HAS3C	Extended Hybrid Manual Station Block

Block type	Model	Name
Unit Instrument	_UTSW	3-Position Switch-Type Unit Instrument
	_UTPB	5-Pushbutton-Type Unit Instrument
	_UTAS	Analog-Type Unit Instrument
Non-Resident Unit Instrument	_UTSW-N	Non-Resident Unit Instrument with Three-Position Switch
	_UTPB-N	Non-Resident Unit Instrument with Five-Pushbutton Switch
	_UTAS-N	Analog Non-Resident Unit Instrument
Operation	OPSBL	SEBOL-Type Operation
	OPSFC	SFC-Type Operation
	OPSFCP1	SFC-Type Operation with Floating-Data Parameters
	OPSFCP2	SFC-Type Operation with Character-Data Parameters
	OPSFCP3	SFC-Type Operation with Floating/Character-Data Parameters
	OPSFCP4	SFC-Type Operation with Integer/Character-Data Parameters
	OPSFCP5	SFC-Type Operation with Floating/Integer-Data Parameters

C. LIST OF FUNCTION BLOCKS

Block type	Model	Name
Valve Pattern Monitor (*1)	VPM64	64-Data Valve Pattern Monitor
	VPM128	128-Data Valve Pattern Monitor
	VPM256	256-Data Valve Pattern Monitor
	VPM512	512-Data Valve Pattern Monitor
	VPM64A	64-Data Valve Pattern Monitor with Alarm
	VPM128A	128-Data Valve Pattern Monitor with Alarm
	VPM256A	256-Data Valve Pattern Monitor with Alarm
	VPM512A	512-Data Valve Pattern Monitor with Alarm

Block type	Model	Name
Off-Site Block (*1)	FSBSET	Batch Set Control Block
	BLEND	Blending Master Control Block

C. LIST OF FUNCTION BLOCKS

Block type	Function block model
Regulatory Control/ Calculation	PVI, PVI-DV PID, PI-HLD, PID-BSW, ONOFF, ONOFF-E, ONOFF-G, ONOFF-GE, PID-TP, PD-MR, PI-BLEND, PID-STC MLD, MLD-PVI, MLD-SW, MC-2, MC-2E, MC-3, MC-3E RATIO, PG-L13, BSETU-2, BSETU-3 VELLIM SS-H, SS-M, SS-L, AS-H, AS-M, AS-L, SS-DUAL FOUT, FFSUM, XCPL, SPLIT PTC ADD, MUL, DIV, AVE SQRT, EXP, LAG, INTEG, LD, RAMP, LDLAG, DLAY, DLAY-C AVE-M, AVE-C, FUNC-VAR, TPCFL, ASTM1, ASTM2 SW-33, SW-91, DSW-16, DSW-16C, DSET, DSET-PVI SLCD, SLPC, SLMC, SMST-111, SMST-121, SMRT, SBSD, SLBC, SLCC, STLD FF-AI, FF-DI, FF-CS, FF-PID, FF-RA, FF-AO, FF-DO, FF-OS, FF-SC, FF-IT (*1) FF-IS, FF-MDI, FF-MDO, FF-MAI, FF-MAO, FF-SUNV (*1)
Sequence	ST16, ST16E, LC64
Switch Instrument	SI-1, SI-2, SO-1, SO-2, SIO-11, SIO-12, SIO-21, SIO-22, SIO-12P, SIO-22P SI-1E, SI-2E, SO-1E, SO-2E, SIO-11E, SIO-12E, SIO-21E, SIO-22E, SIO-12PE, SIO-22PE
Sequence Auxiliary-1	TM, CTS, CTP, CI, CO
General-Purpose Calculation	CALCU, CALCU-C
Faceplate	INDST2, INDST2S, INDST3, PBS5C, PBS10C, BSI, HAS3C
Logic Operation	AND, OR, NOT, SRS1-S, SRS1-R, SRS2-S, SRS2-R WOUT, OND, OFFD, TON, TOFF, GT, GE, EQ, BAND, BOR, BNOT
Sequence Auxiliary-2	ALM-R, RL, RS, VLVM
Batch Data	BDSET-1L, BDSET-1C, BDSET-2L, BDSET-2C, BDA-L, BDA-C
SFC Block	_SFCSW, _SFCPB, _SFCAS
Operation	OPSBL, OPSFC OPSF1CP1, OPSF1CP2, OPSF1CP3, OPSF1CP4, OPSF1CP5
Unit Instrument	_UTSW, _UTPB, _UTAS _UTSW-N, _UTPB-N, _UTAS-N
Off-Site Block	FSBSET, BLEND

Project Common

System View (CS3000) - COMMON

File Edit View Tools Load Project FCS HIS Help

All Folders

- SYSTEM VIEW
 - TRAIN3
 - COMMON
 - BATCH
 - FCS0101
 - CONFIGURATION
 - SEQ_LIBRARY
 - IOM
 - SWITCH
 - MESSAGE
 - FUNCTION_BLOCK
 - DISPLAY
 - FCS0102
 - FCS0103
 - FCS0104
 - HIS0163
 - HIS0164
 - TRAINING

Opened Folder : COMMON

Name	Type	Modified
AlmPri	Alarm Priority	2001/10/03 00:00
AlmStsLabel	Alarm Status Character String	2001/10/03 00:00
AlmTbl	Alarm Processing Table	2002/09/02 13:09
BlkStsLabel	Block Status Character String	2001/10/03 00:00
CustomPlant	Plant Hierarchy	2001/10/03 00:00
EngUnit	Engineering Unit Symbol	2006/03/20 15:43
InstLabel	Switch Position Label	2006/03/20 14:51
MultiPjt	Multiple Projects Connection Function	2001/10/03 00:00
OpeMarkDef	Operation Mark	2006/01/17 16:03
StnConf	Station Configuration	2006/04/13 10:26
StsChange	Status Change Command Character String	2001/10/03 00:00
SysStsLabel	System Fixed Status Character String	2001/10/03 00:00
UserSec	Security	2006/03/20 17:30

Alarm Priority

Function	CRT	PRT	Historical File	Alarm Action	Rewarning
Occurrence	1	Yes	Yes	Lock Type	Yes
Recovery	0:No 1:Yes	Yes	Yes	Lock Type	No

Designate in the Alarm Priority Builder whether or not the status change is to be displayed in a window upon occurrence of the alarm or upon recovery of the system.

Designate in the Alarm Priority Builder whether or not the status change is to be printed out to a printer upon occurrence of the alarm or upon recovery of the system.

Designate in the Alarm Priority Builder whether or not the status change is to be logged in a historical message save file upon occurrence of the alarm or upon recovery of the system. A message logged in a historical message save file can be displayed in a Historical Message Report window.

Alarm Priority

Alarm Priority Builder - [Pjt: TRAIN3 File: AlmPri.edf]

File Edit View Tools Window Help

Historical File

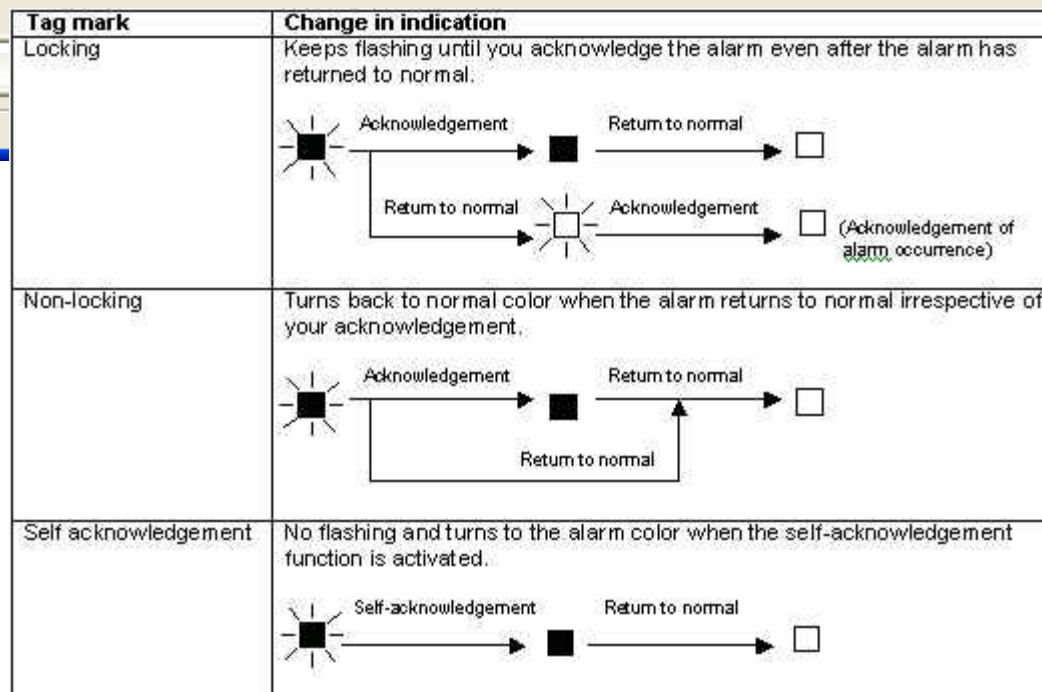
0: No
1: Yes

High-priority Alarm Medium-priority Alarm Low-priority Alarm Alarm Logging Only Reference Alarm

Function	Historical File	Alarm Action	Rewarning	NR
Occurrence	1	1	Yes	On Alarm Dependent Type
Recovery	Yes	1: Lock Type 2: Non-lock Type 3: Self ACK Type	No	On Alarm Dependent Type

Message

Ready



Alarm Priority

The image displays two overlapping software windows from the Yokogawa TRAIN3 system. The background window is the 'Alarm Priority Builder' for file 'AlmPri.edf', showing tabs for 'Historical File', 'High-priority Alarm', 'Medium-priority Alarm', 'Low-priority Alarm', 'Alarm Logging Only', and 'Reference Alarm'. The foreground window is the 'FCS Constants Builder' for file 'StnDef.edf', showing the 'Definitions' tab. In this tab, the 'Interval of Repeated Warning Alarms [sec]' is highlighted with a red rectangle and set to 600. Other settings include 'Wind Up Time [sec]' at 60, 'SEBOL/User C Ratio[%]' at 100, 'Alarm Mask for Initial Cold Start' set to 'Yes', 'Inter-station data link communication period [sec]' at 1, and 'Re-transmission skip when inter-station data link error' at 60. A file explorer on the left shows the project structure under 'SYSTEM VIEW' and 'TRAIN3', with 'FCS0101' and 'CONFIG' folders expanded. The status bar at the bottom indicates '2 objects' and 'Ready'.

Alarm Priority Builder - [Pjt:TRAIN3 File:AlmPri.edf]

File Edit View Tools Window Help

Historical File | High-priority Alarm | Medium-priority Alarm | Low-priority Alarm | Alarm Logging Only | Reference Alarm

0:No | Function | Historical File | Alarm Action | Rewarning | NR

System View (CS3000) - CONFIGURATION

File Edit View Tools L

FCS Constants Builder - [Pjt:TRAIN3 Stn:FCS0101 File:StnDef.edf]

File Edit View Tools Window Help

Wind Up Time [sec] | Definitions | Scan Transmission | Detailed Settings

Wind Up Time [sec] 60

SEBOL/User C Ratio[%] 100

Interval of Repeated Warning Alarms [sec] 600

Alarm Mask for Initial Cold Start Yes

Inter-station data link communication period [sec] 1

Re-transmission skip when inter-station data link error 60

Message

2 objects Ready

Alarm Processing Table

Alarm Processing Table Builder - [Pjt:TRAIN3 File:AlmTbl.edf]

File Edit View Tools Window Help

Color[5]	Bit	Color[1]	Priority[1]	Color[2]	Priority[2]
N:Black	7	Blue	High-priority Alarm	Blue	Medium-priority Alarm
R:Red	8	Cyan	High-priority Alarm	Cyan	Medium-priority Alarm
G:Green	9	Green	High-priority Alarm	Green	Medium-priority Alarm
Y:Yellow	10	Red	High-priority Alarm	Red	Medium-priority Alarm
B:Blue	11	Red	High-priority Alarm	Red	Medium-priority Alarm
M:Magenta	12	Red	High-priority Alarm	Red	Medium-priority Alarm
C:Cyan	13	Red	High-priority Alarm	Red	Medium-priority Alarm
W:White	14	Red	High-priority Alarm	Red	Medium-priority Alarm
SB:Steel Blu	15	Red	High-priority Alarm	Red	Medium-priority Alarm
PK:Pink	16	Red	High-priority Alarm	Red	Medium-priority Alarm
SG:Spring Gr	17	Red	High-priority Alarm	Red	Medium-priority Alarm
OR:Orange	18	Red	High-priority Alarm	Red	Medium-priority Alarm
YG:Yellow Gr	19	Red	High-priority Alarm	Red	Medium-priority Alarm
VO:Violet	20	Red	High-priority Alarm	Red	Medium-priority Alarm
DB:Deep Sky	21	Yellow	High-priority Alarm	Yellow	Medium-priority Alarm
GR:Gray					

Message

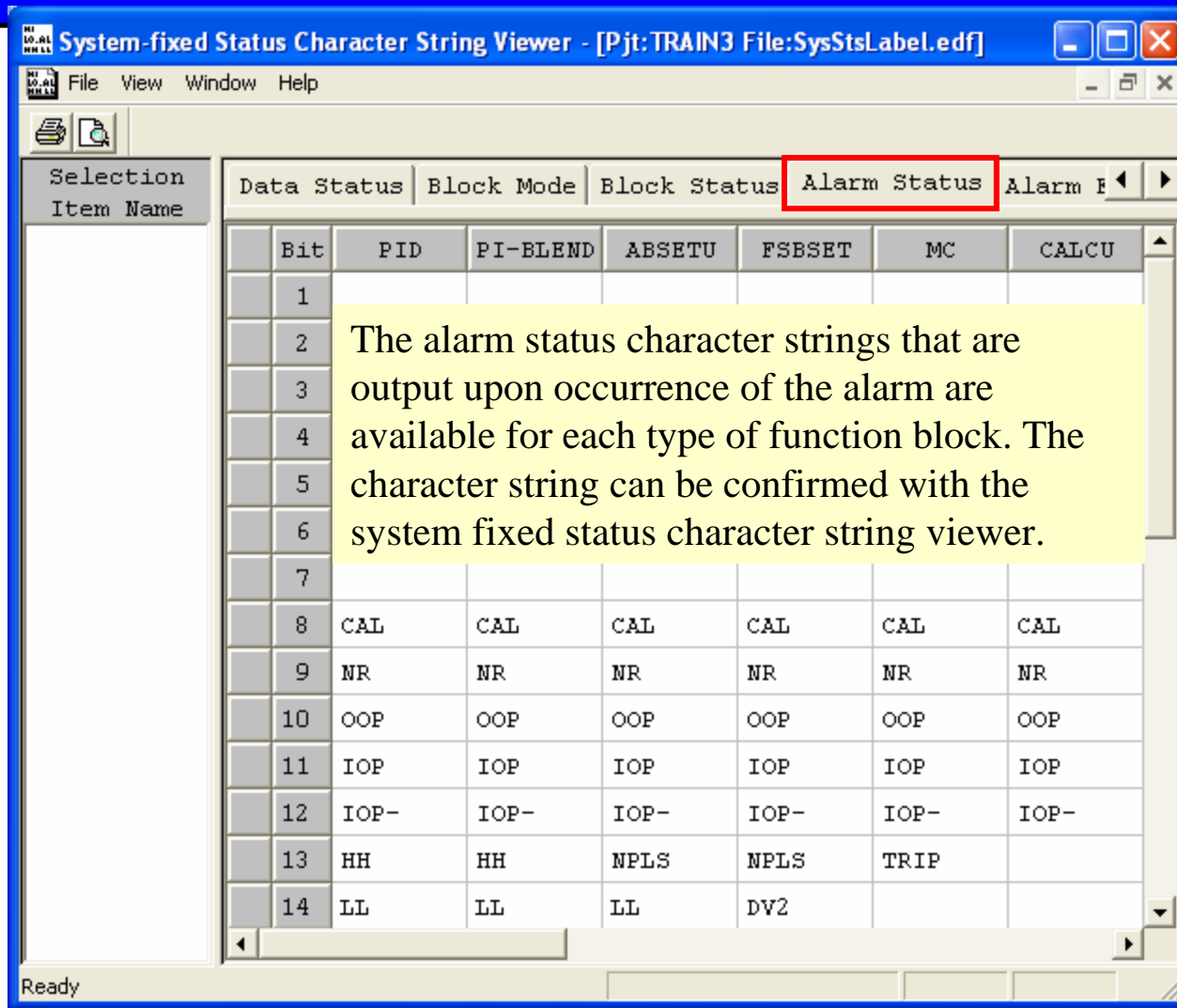
Ready

Alarm status bit 1 – 6 not displayed, system fixed

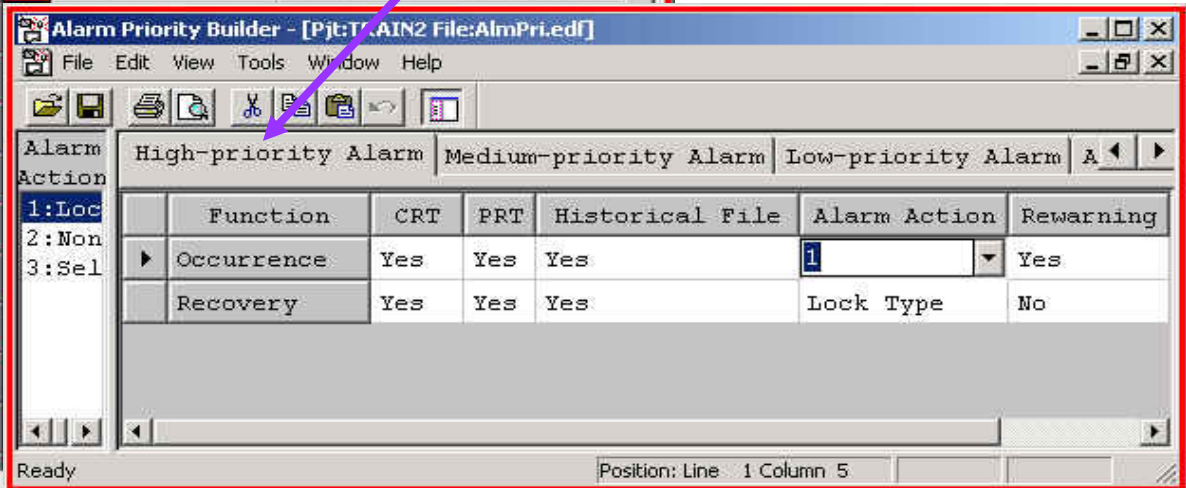
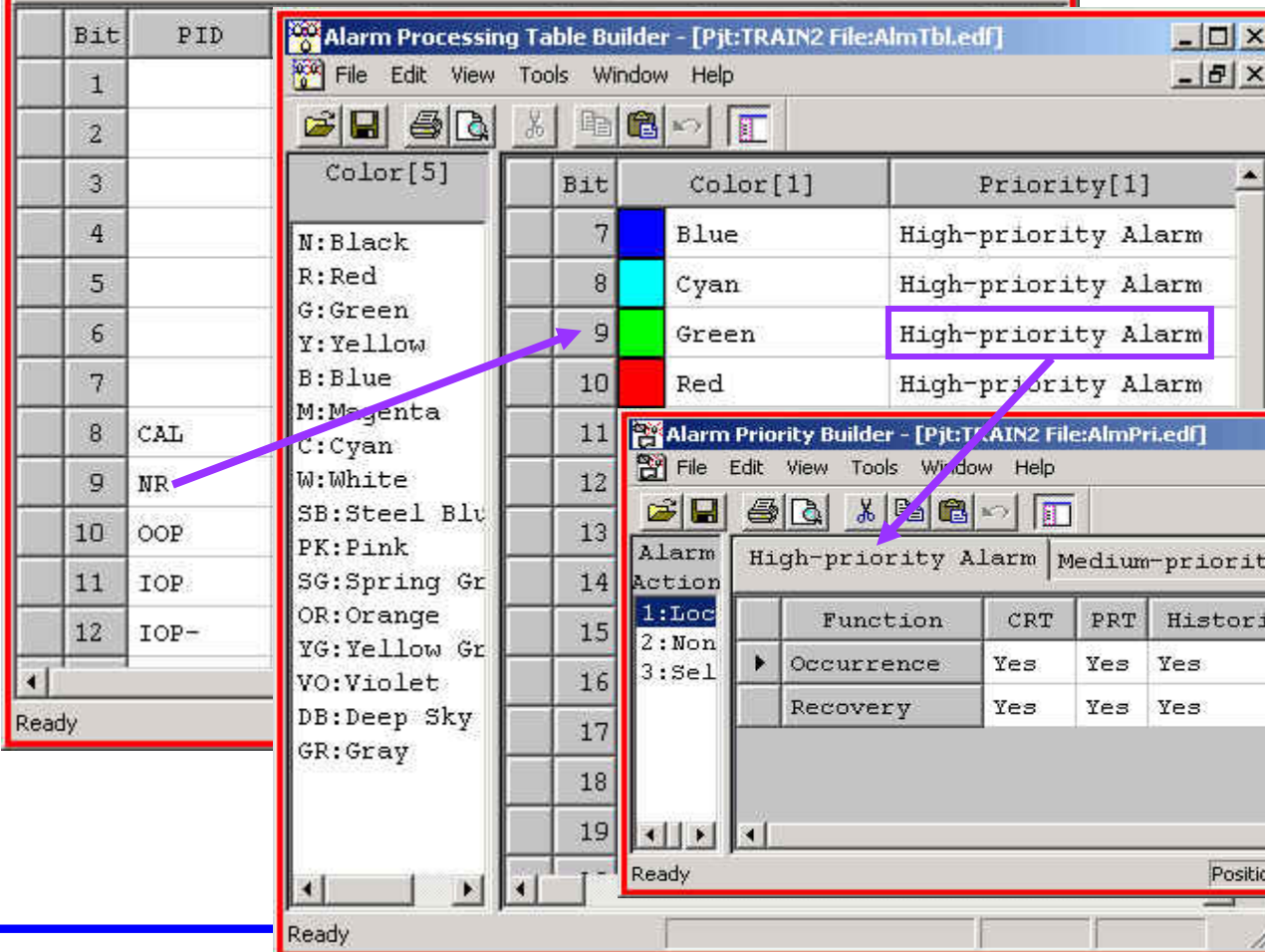
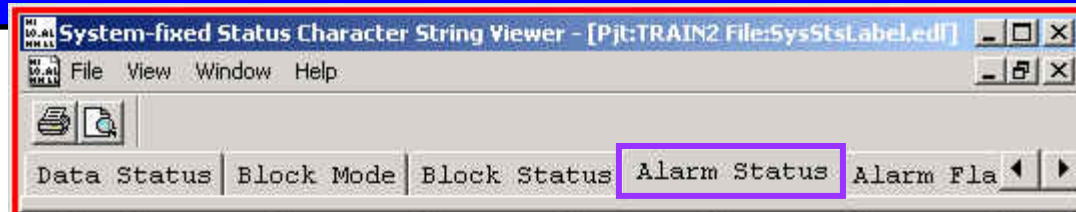
Alarm processing levels 1- 4 system fixed, 5 – 16 User defined

e.g. NR is assigned with green for alarm processing levels 1-4

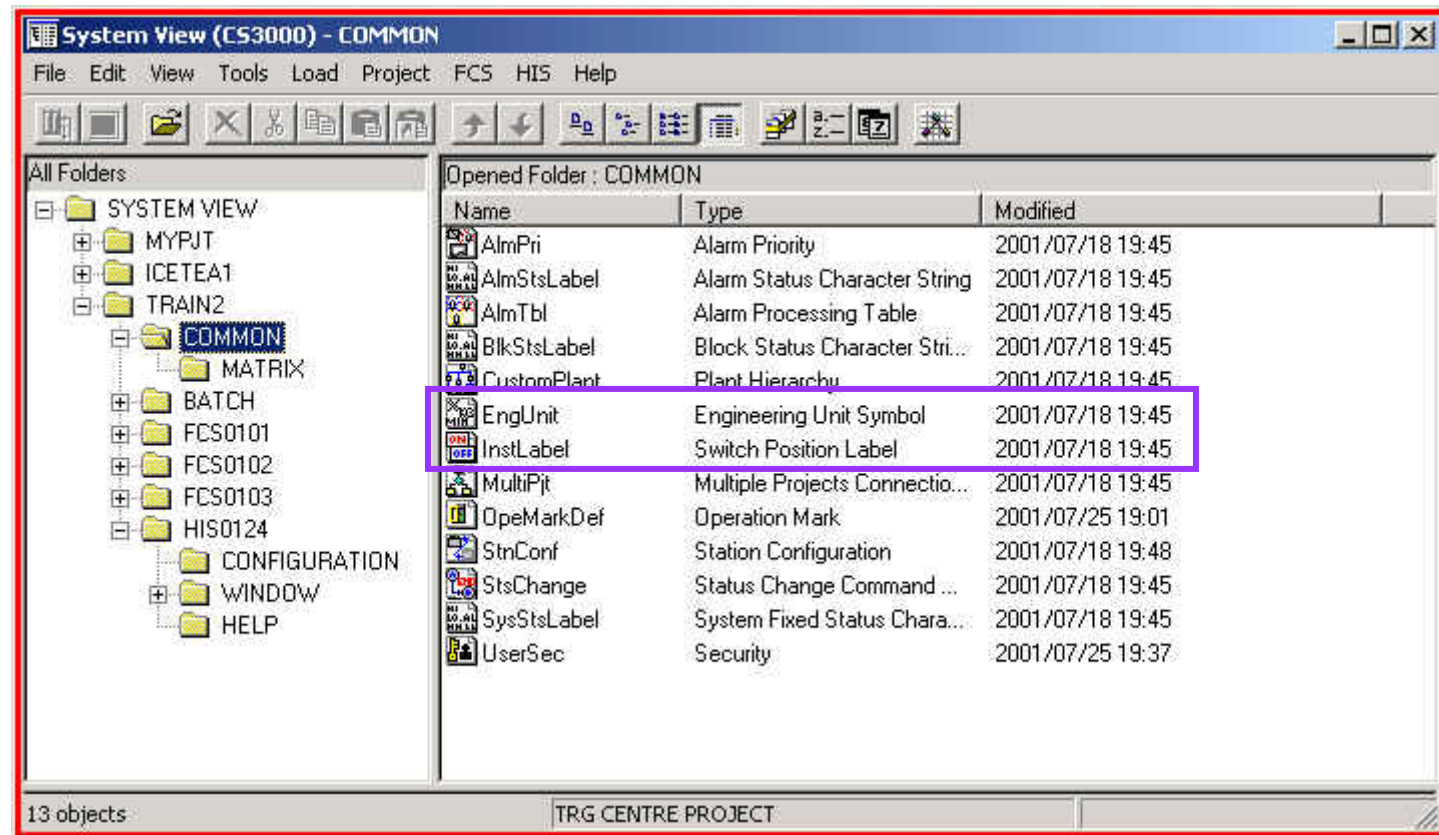
System-fixed Status Character String



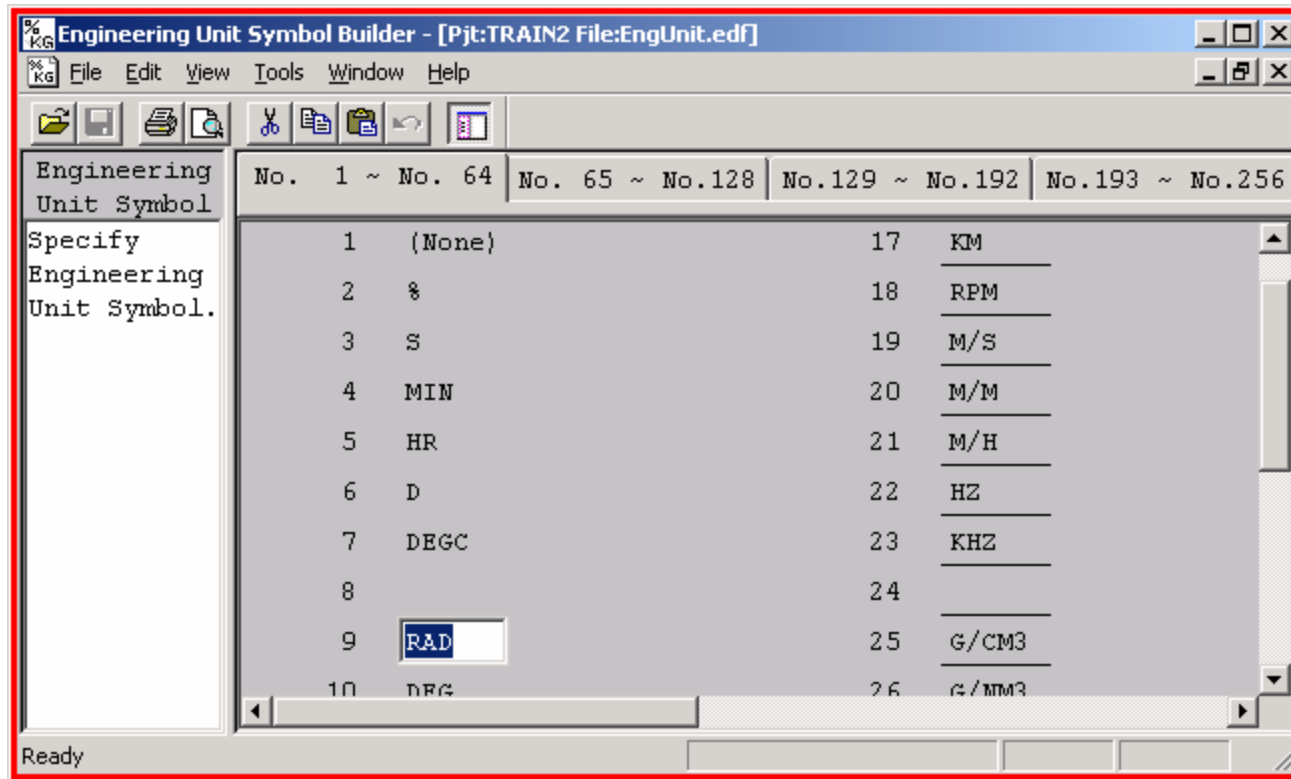
System-fixed Status Character String/ Alarm Processing Table/ Alarm Priority



Project Common



Up to 256 engineering unit symbols can be used for one project.

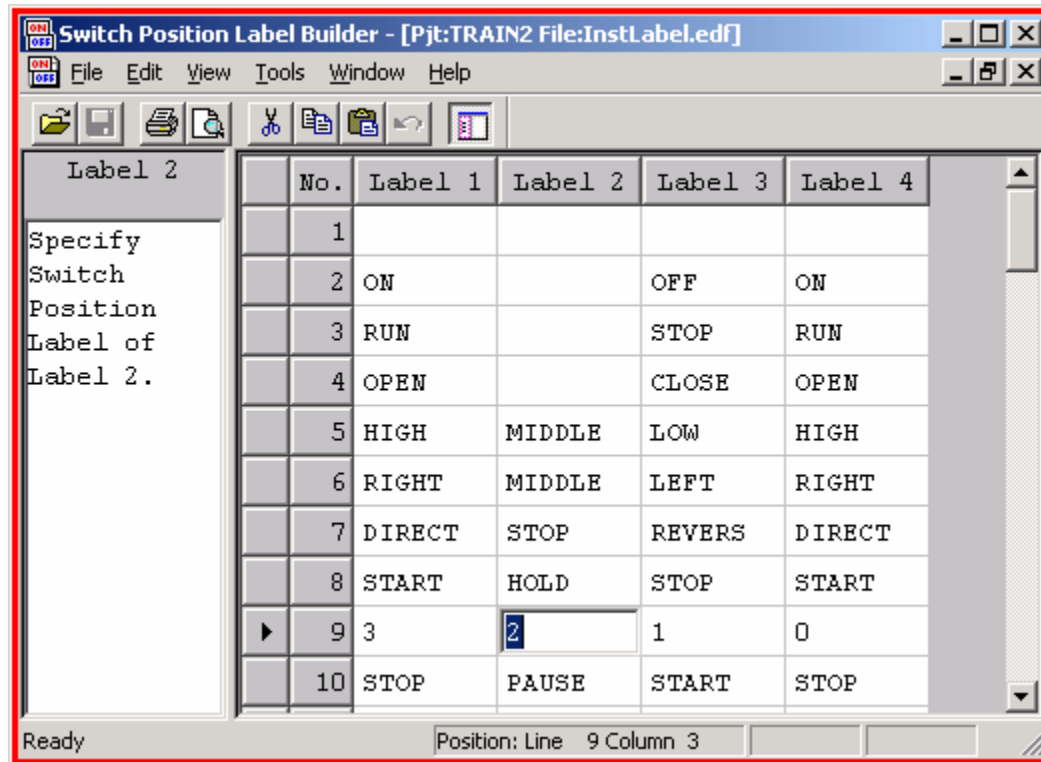


One engineering unit symbol can be defined with up to six alphanumeric characters and it is case-sensitive

Nos.1 to 8 cannot be changed or deleted. Default values are predefined for Nos.9 to 126.

Switch Position Label

Up to 64 switch position labels can be used for one project.
Switch position labels Nos.1 and 2 cannot be changed or deleted.
Default values are predefined for Nos.3 to 13.



MYPJT\InstLabel.TXT

Switch position label

No.	1	2	3	4
01				
02	ON		OFF	ON
03	RUN		STOP	RUN
04	OPEN		CLOSE	OPEN
05	HIGH	MIDDLE	LOW	HIGH
06	RIGHT	MIDDLE	LEFT	RIGHT
07	DIRECT	STOP	REVERS	DIRECT
08	START	HOLD		
09	3	2		

First Second Third Fourth

Figure Label for Switch Position List

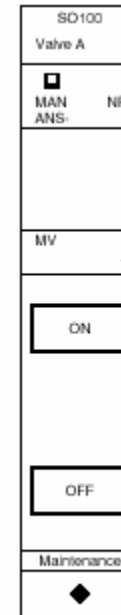
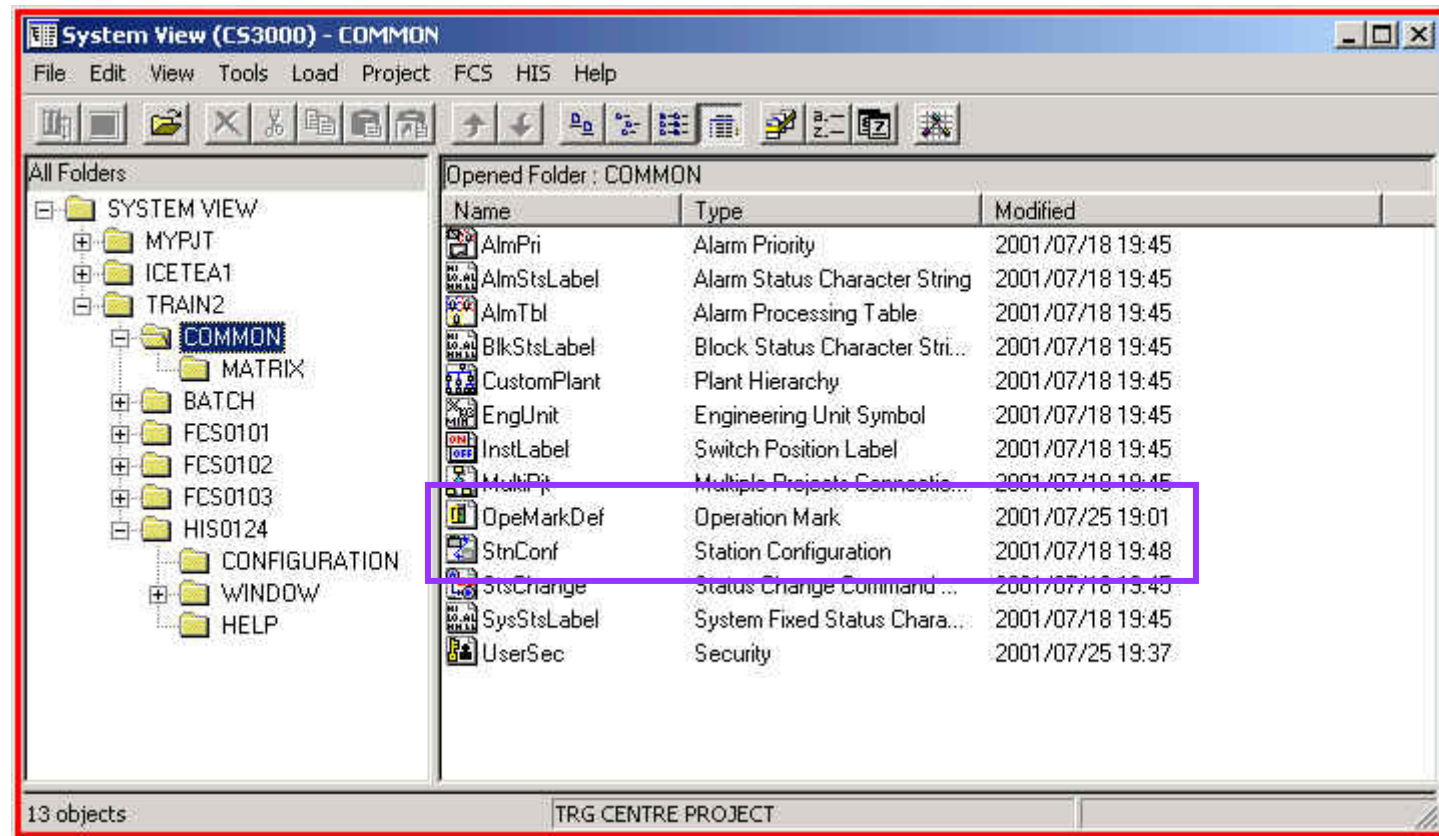


Figure Label for Switch Position 1



Figure Label for Switch Position 2

Project Common



Attaching operation mark may temporarily change the write access right on the block during plant operation. There are 64 operation marks available for configuration.

Operation Mark Builder - [Pjt: TRAIN3 File: OpeMarkDef.edf]

File Edit View Tools Window Help

install/Remove

No.	Tag Label	Color	Tag Level	Install/Remove
1	CAUTION	Steel Blue	3	3
2	TEST	Violet	1:Comment Type	1:All Privileges
3	OPMARK03	White	2:S2,S3 Privileges	2:S2,S3 Privileges
4	OPMARK04	White	3:S3 Privilege	3:S3 Privilege
5	OPMARK05	White	4:Operation Guard Type	1 Privileges
6	OPMARK06	White	5:5	1 Privileges
7	OPMARK07	White	6:6	1 Privileges
8	OPMARK08	White	7:7	1 Privileges
9	OPMARK09	White	8:8	1 Privileges
10	OPMARK10	White	Comment type	All Privileges
11	OPMARK11	White		

Message

Ready

Table Security Levels Exerted by Operation Marks and the Types Of Operation Marks

Types of Operation Marks	Security Levels Exerted by Operation Marks	Privilege level		
		S1	S2	S3
1 (Comment Type)	1	Y	Y	Y
2 (S2, S3 Privileges)	2	N	Y	Y
3 (S3 Privilege)	3	N	N	Y
4 (Operation Guard Type)	4	N	N	N
5	5	N	Y	Y
6	6	N	N	Y
7	7	N	N	Y
8	8	N	N	N

8 characters can be entered as the text on the label (string)

Station Configuration

Overview of the station configured for the project.

Station Configuration Viewer - [Pjt:TRAIN3 File:StnConf.edf]

No.	Domain number	Station number	Station Name	Alias of Station	
001	1	1	FCS0101		AFS40D Duplexed Field Control
002	1	2	FCS0102		AFS20D Duplexed Field Control
003	1	3	FCS0103		AFS20D Duplexed Field Control
004	1	64	HIS0164		PC With Operation and monitori
005					
006					
007					
008					
009					

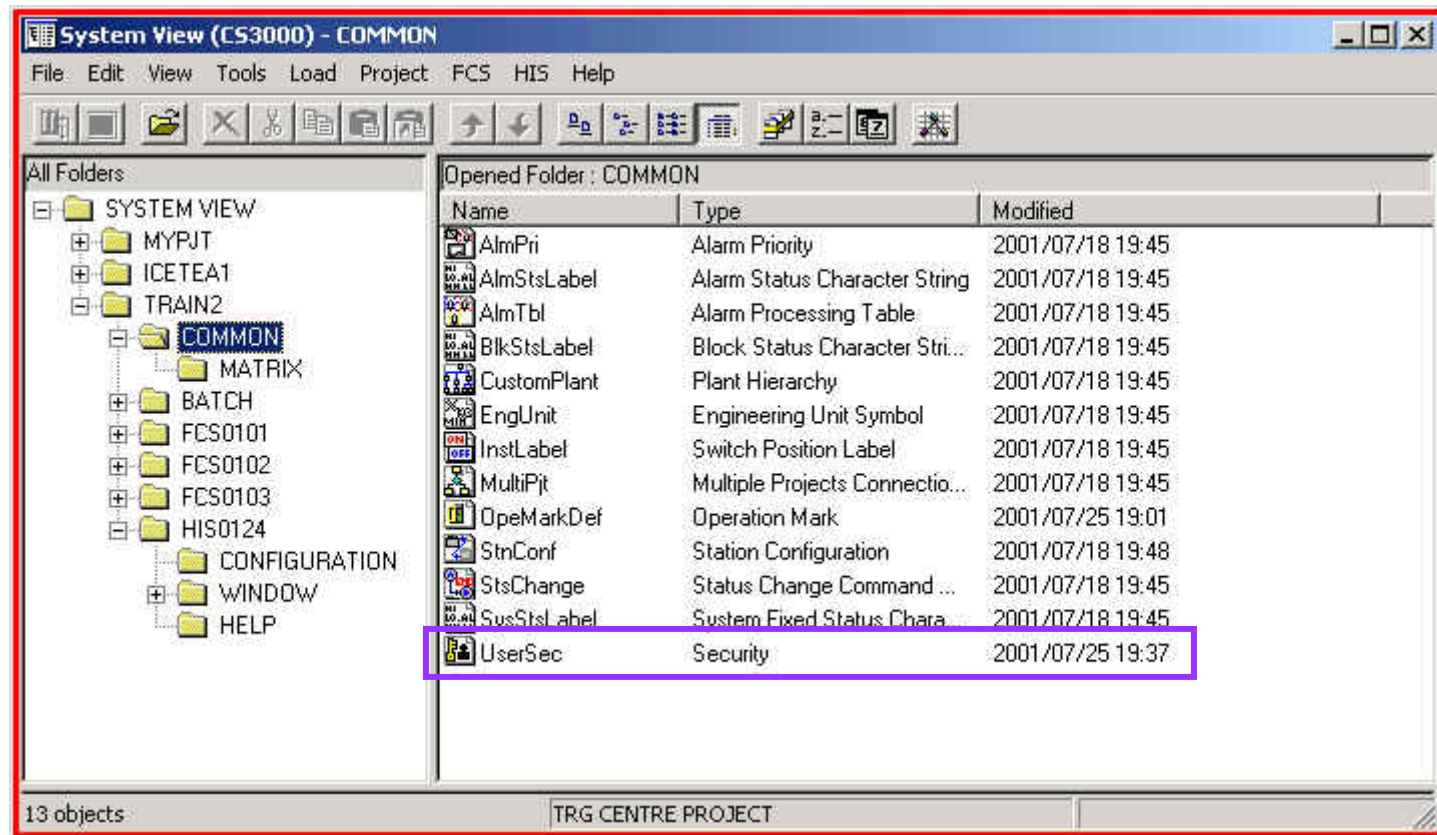
Ready

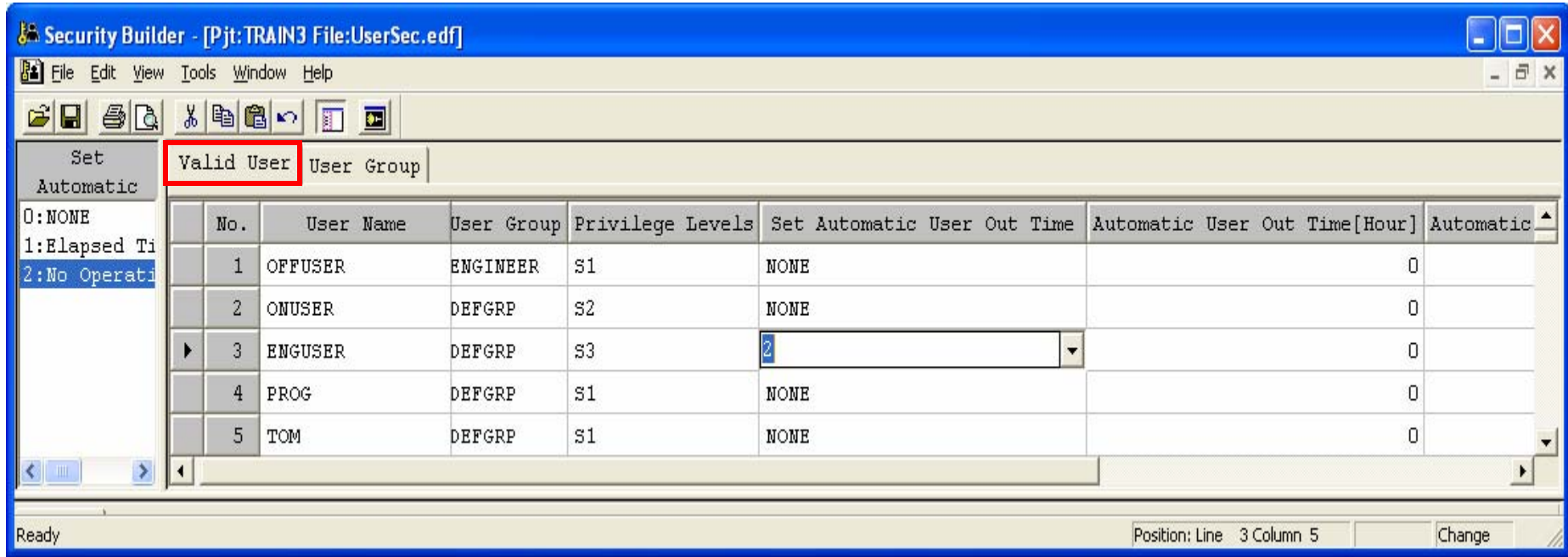
Station Configuration Viewer - [Pjt:TRAIN3 File:StnConf.edf]

No.	Ethernet Host Name	Ethernet Address	Subnet mask	Vnet Host Name	Vnet Address	Subnet Mask
001				FCS0101	172.16.1.1	255.255.0.0
002				FCS0102	172.16.1.2	255.255.0.0
003				FCS0103	172.16.1.3	255.255.0.0
004	E0164	172.17.1.64	255.255.0.0	M0164	172.16.1.64	255.255.0.0
005						
006						
007						
008						
009						

Ready

Project Common





Valid User:

User Name	Set Automatic User Out Time	Comment
User Group	Automatic User Out Time [Hour]	
Privilege Levels	Automatic User Out Time [Minute]	

Each user name must be unique, consisting of eight alphanumeric characters or fewer and is not case-sensitive.

Up to 250 users can be defined for CS 3000 system.

Table Default User Names

User name	Privilege level	User group	Description
OFFUSER (*1)	S1	DEFGRP	User name for monitoring data
ONUSER	S2	DEFGRP	User name for operation and monitoring data
ENGUSER	S3	DEFGRP	User name for maintenance
PROG (*2)	S1	DEFGRP	User name for accessing data from a user program
TESTUSER	S3	DEFGRP	User name for conducting a virtual test

F090101E.EPS

*1: When the user group for OFFUSER is changed to NONEGRP and the HIS is started, the operation and monitoring will be disabled.

*2: User cannot user-in as PROG.

The users are classified into groups based on their operation and monitoring authorities. Each group is called user group.

Each user group name must be unique and in 8 or less alphanumeric characters. 50 user groups may be assigned to one project for CS 3000.

Table Default User Group

User group name	Monitoring scope	Operation and monitoring scope	Window scope	Confirmation operation scope	Messaging scope	Description
DEFGRP	ALL	ALL	ALL	ALL	ALL	Authorized to operate and monitor all control stations and windows connected in the same Control Bus.
NONEGRP	NONE	NONE	NONE	NONE	NONE	Not authorized to operate and monitor any control station and window connected in the Control Bus.

Set Automatic User Out Time

Valid User		User Group			
No.	User Name	Set Automatic User Out Time	Automatic User Out Time[Hour]	Automatic User Out Time[Minute]	
1	OFFUSER	NONE	0	0	
2	ONUSER	0	0	0	
3	ENGUSER	0:NONE		0	
4	PROG	1:Elapsed Time from User In		0	
5	TOM	2:No Operation Time		0	

Range of 0 hour 1 minute to 24 hours 0 minute

Range of 1 to 59 minutes

User may be automatically user-out under the following optional conditions:

- **Automatically User-Out Due to No Operation Timeout**

If the keyboard or the mouse has not been touched for a designated time period, the user is automatically user-out.

- **A Certain Time Elapsed since User-In**

User may be automatically user-out after a certain time elapsed since the user-in.

By default, Automatic User-Out is not activated. OFFUSER is not subject to Automatic User-Out.

User Group

Security Builder - [Pjt: TRAIN3 File:UserSec.edf]

File Edit View Tools Window Help

Monitoring Range

Valid User **User Group**

No.	User Group Name	Monitoring Range	Operation and Monitoring Range	Window Range	Acknowledgment	Process Message Rece
1	DEFGRP	ALL	ALL	ALL	ALL	ALL
2	NONEGRP	NONE	NONE	NONE	NONE	NONE
3	ENGINEER	FCS0101	FCS0101	CG****	FCS0101	FCS0101

Message

---- ERROR = 0 WARNING = 0 ----

Ready

Position: Line 3 Column 3

Monitoring Range

Operation and Monitoring Range

Window Range

Acknowledgment

Process Message Receiving

System Alarm Receiving

Exclude Operation

Exclude Operation and Monitoring

Exclude Acknowledgment

Exclude Process Message

Exclude System Alarm

Comment

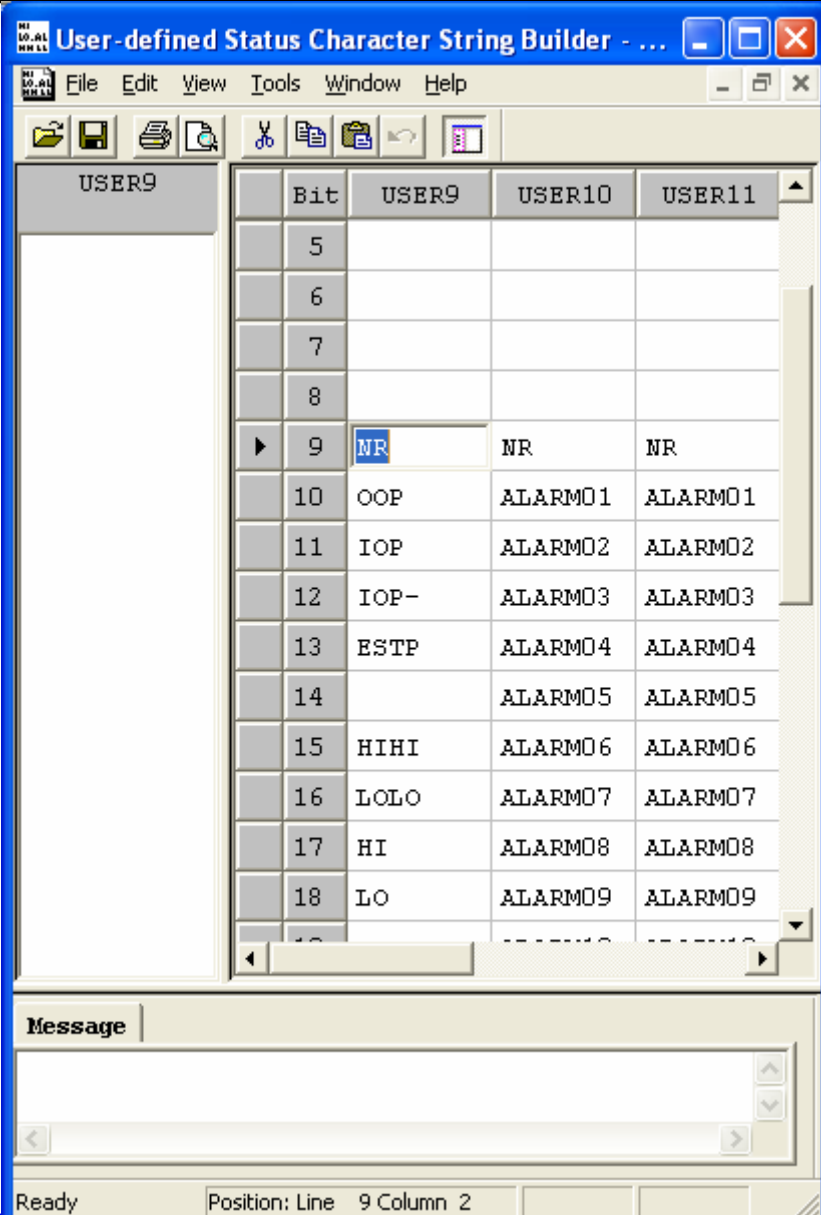
FCS0101

ALL:All Stations and Windows
NONE:No stations are possible.

Specify a plant hierarchy name/ station name.

When setting operation and monitoring rights on designated station names or window names, the wild card character “*” can be used instead of part or all characters in a character string.

User-defined Status Character String



The function blocks that can use the alarm status character strings designated here are faceplate blocks, SFC blocks, and unit instruments. There is a table reserved for each of these function blocks, used for designating the alarm status character strings. The figure below shows the relationship between the alarm status character string and the bit position (default) for each function block:

Table Alarm Status Character String Definition (Default)

For bit position	For faceplate block	For SFC block	For unit instrument	For bit position	For faceplate block	For SFC block	For unit instrument
	USER9	USER10	USER11 to USER16		USER9	USER10	USER11 to USER16
1				17	HI	ALARM08	ALARM08
2				18	LO	ALARM09	ALARM09
3				19		ALARM10	ALARM10
4				20		ALARM11	ALARM11
5				21	DV+	ALARM12	ALARM12
6				22	DV-	ALARM13	ALARM13
7				23		ALARM14	ALARM14
8				24		ALARM15	ALARM15
9	NR	NR	NR	25	TRP	ALARM16	ALARM16
10	OOP	ALARM01	ALARM01	26	SCBL	ALARM17	ALARM17
11	IOP	ALARM02	ALARM02	27	INT	ALARM18	ALARM18
12	IOP-	ALARM03	ALARM03	28	ERR	ALARM19	ALARM19
13	ESTP	ALARM04	ALARM04	29	DISC	ALARM20	ALARM20
14		ALARM05	ALARM05	30	BLCK	ALARM21	ALARM21
15	HIHI	ALARM06	ALARM06	31		ALARM22	ALARM22
16	LOLO	ALARM07	ALARM07	32	CNF	ALARM23	ALARM23
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Thanks!