CS3000 - System Configuration

- Ethernet
- HIS / ENG
- HIS
- Remote Domain System
- CGW
- V net
- BCV
- PFCS
- LFCS
- FFCS
- KFCS
- CS, CS 1000 CENTUM-XL, -V MXL

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V net : Extension Details

- HIS
- HIS
- HIS
- V net
- Optical Fibre
- Optical Fibre
- Co-axial Cable
- T
- R R
- R R
- T
- T
- R R
- R R
- T

Max. 500m | Max. 15 km | Max. 500m | Max. 15 km | Max. 500m

Overall Max. 20 km

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Domain Concept

- Domains are group of stations connected on the V-net. Maximum 64 stations can be connected per domain. Bus Convertor (BCV) is used to link two domains.

- Multiple Domains are used
    - when there are more than 64 stations to be connected
    - when there are multiple sections in a plant
    - to reduce the load on the V net.

ETHERNET
HIS
V NET
FCS
Domain 1
BCV
ETHERNET
HIS
V-NET
FCS
Domain 2

Bus Convertor

EOPS
ETHERNET
HIS
HF BUS
BCV
V-NET
CENTUM-XL SYSTEM
EFCD
FCS
CS3000 SYSTEM
Domain 1
Domain 2

Bus Convertor (BCV) is used to link two domains. Different types of Bus Convertors are available.

- V net to V net Bus Convertor is used to connect CS3000 or Centum CS to CS3000 system.

- HF Bus to V net Convertor is used to connect Centum V or Centum-XL to CS3000 system or Centum CS to CS3000 system.

- RL Bus to V net Convertor is used to connect Micro-XL to CS3000 system.

CENTUM CS 3000 – Specifications

Maximum number of stations	: 256/System	
Maximum number of domains	: 16/System	
Numbering of domains	: 1 to 64	
Domain number for CS3000 domain (V-net domain)	: 1 to 16	
Domain number for Virtual Domain (Non V-net domain)	: 17 to 64	
Maximum number of stations per domain	: 64	
Maximum number of HIS per domain	: 16	
Station number for HIS	: 1 to 64 in descending order	
Station number for FCS	: 1 to 64 in ascending order	
Maximum number of Nodes per FFCS	: 3	
Maximum number of Input /Output Modules per FFCS nodes + 6 I/O modules in the main CPU nest)	: 30 (3*8=24 I/O modules in	
Maximum length of V-net	: 500 m	
Maximum length of V-net with optical adapters	: 20 Km	

Field Control Station FFCS Hardware View

The image below shows the hardware configuration of the CS3000 FCS.

Eight FIO slots

Detachable bottom unit

EC401 ESB bus coupler (Note)

Power supply unit

CP401 CPU module

AIP504 Vnet coupler (10BASE2 Vnet cable is used.)

Note: Two I/O slots are to be used for NIU extension.

Hardware Configuration- Local Node

V net

FFCS

CP401 | CP401 | PW48X | PW48X

FFCS

EC401 | EC401 | CP401 | CP401 | PW48X | PW48X

FIO: Max. 8

Up to 6 I/O Modules

ESB bus

SB401 | SB401 | PW48X | PW48X

Minimum Configuration

Up to 8 I/O Modules

FFCS Supports maximum of 3 Local nodes and 3 Remote nodes

SB401 | SB401 | PW48X | PW48X

Local node Max. 3

Maximum Configuration

SB401 | SB401 | PW48X | PW48X

Hardware Configuration – Remote Node

V net

FFCS

EB401 | EB401 | EB401 | EB401 | EB401 | EB401 | CP401 | CP401 | PW48X | PW48X

Optical Repeater can be used

Remote node

EB501 | EB501 | PW48X | PW48X

Remote node

EB501 | EB501 | PW48X | PW48X

Remote node

ER bus

EB501 | EB501 | PW48X | PW48X

Expanded Remote node up to 3

HIS (Human Interface Station)

⇢ The Station for Real time Plant Monitoring/Operation

Plant Operation by thousands of Graphics

Real time display of Plant Abnormalities.

Easy Operation by a mouse, a keyboard etc.

⇢ Types of HIS

⇢ **DESKTOP HIS:**

⇢ **A IBM PC/AT compatible machine is generally used. Apart from the general PC, the Yokogawa PC is also supported. Specifications of the PC HIS Desktop are as follows:**

⇢ **CPU   : Pentium IV Processor**

⇢ **Main Memory   :   256 MB (Minimum)**

⇢ **Hard Disk   : 20 GB or more**

⇢ **Video Display   : 1024 x 768 or more, 256 colours**

⇢ **CRT Monitor   : Multi Scan 17" monitor or larger**

⇢ **Serial Port   : RS232C one port or more**

⇢ **Parallel Port   : One port or more**

⇢ **Extension Slot   : PCI slot for V/VL net card, ISA slot for Ethernet**

⇢ **Power Supply   : 200-240V AC**

⇢ **Basic Software : Windows NT with Service Pack ,Windows 2000 or**

⇢ **   Windows XP**

⇢ **Operation keyboard can also be connected to the Desk Top HIS.**

⇢ **CONSOLE HIS**

⇢ **The floor mounted console type HIS comes with 21" monitor which has a touch panel operation. It has an operation keyboard and an engineering keyboard.**

HIS Models : CRT/LCD

The figure below indicates the different models of HIS supported by CS3000.

Dual Stack CRT/LCD Consoles

PC

Enclosed display style console HIS

Open display style console HIS

Ethernet

V net

With/Without Touch screen

Generic PC

Console

PC

Single Stack

Open display style console HIS

VL net

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Multiple Monitor Advantage

Efficient monitoring/control of Advanced Process Control/Operation by a single operator with dual monitor

Single Monitor

Windows overlap each other. Hard to see!

Dual Monitors

Much easier to see!

YOKOGAWA ♦

Application Capacity of HIS

- **Maximum number of tags that can be monitored from HIS : 1000000**

- **Maximum number of windows that can be created per HIS : 4000**

- **Maximum number of Trend Recording Points per HIS : 2304**

Operation Windows

Information regarding the process is gathered as well as monitored by the following Standard Operation windows on the HIS.

- **Instrument Faceplate Window**
- **Tuning Window**
- **Control Group Window**
- **Trend Window**
- **Process Alarm Window**
- **Operator guide Message Window**
- **Graphic Window**
- **Overview Window**
- **Process Report Window**
- **Historical Report Window**

Operation Windows

SYSTEM MESSAGE AREA

NAVIGATOR

NAME

WINDOW CALL

TOOL BOX

OPERATION WINDOW AREA

All operation windows can be called from the System Message Area icons.

The windows can be called by using
NAME icon
TOOL BOX icon
WINDOW CALL icon
NAVIGATOR icon

The windows can also be called using the keys on the operator keyboard.

Calling Windows from NAME Icon

To call any window, select the NAME icon and type the Window name. Select OK. The window will appear.

Windows can be called in Large size or Medium size.

To call Large size windows
 type WINDOWNAME –SL

To call Medium size windows
type WINDOWNAME – SM.

Methods of Calling windows

9/30/2004 4:34 PM

DataBase Equalize Complete

GR0001 [M]

SYSTEM MESSAGE AREA ICONS

HIS windows can be called by selecting The respective icons from the System Message Area.

The HIS windows can also be called by the keys on the operator keyboard.

Operator Keyboard

Ready

Start | System Vie... | Generation ... | Picot | Test Functi... | GR0001 [M] | Windows | 4:34 PM

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Operator Keyboard Layout

OPERATOR KEYBOARD

OFF ON
ENG

Key positions to select ON USER, OFF USER and ENG USER login

Function Keys that can be programmed for various functions using HIS SET UP menu.

Process Alarm window call Key | Process overview call Key | Tuning window call Key | Graphic window call Key | Window erase Key

Operator guide window call Key | Control window call Key | Trend window call Key | Process Report window call Key | Help dialogue call Key | Cursor Key | Display Key

System Key (calls System Status Overview Window) | Navigator window call Key | Upper sibling window call Key | Print screen Key | Buzzer Stop Key

AUX Key

Circulate Key | Parent window call Key | Lower sibling window call Key | Alarm-acknowledgment Key

FG20306.EPS

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System Message Window Icons

PROCESS ALARM
SYSTEM ALARM
OG MESSAGE
MESSAGE MONITOR
USER LOGIN
CIRCULATE
CLEAR SCREEN
BUZZER RESET
COPY
NAME INPUT
WINDOW CALL
PRESET MENU
OPERATION MENU
TOOL BOX
NAVIGATOR

9/30/2004 4:34 PM

DataBase Equalize Complete

GR0001 [M]

Ready

Multiple icons are provided for calling various functional windows on the HIS

Start | System Vie... | Generation ... | Picot | Test Functi... | GR0001 [M] | Windows   4:34 PM

Instrument Faceplate Window

3/8/2007 2:34 PM

FCS0101   RIGHT   Control

GR0004

Input Window Name
LIC1   OK   Stn

LIC1 TAN...
LIC1
TANK LEVEL C
TR

MAN   IMAN
NR
PV   MM
           0.0
SV   MM
          60.0
MV   %
          45.0

100.0
80.0
60.0
40.0
20.0
0.0

Select the NAME Icon. Type the TAGNUMBER of the instrument. The faceplate window is displayed -

When an instrument is created in the engineering builder, the instrument faceplate window automatically gets created depending on the type of the instrument.

Instrument faceplate window can be called on any Window and the instruments can be directly operated from this window.

Ready

Start | RM | Microsoft ... | System Vi... | Generatio... | Picot | Test Func... | 6 BKHPa...   2:34 PM

Instrument Faceplate Window Details

Tag Mark signifies the Importance of the instrument.

Mode Status indicates the mode of operation of the instrument viz. MAN/ AUT/CAS/PRD etc..

Alarm Status indicates the current alarm status of the instrument viz. NR/HH/HI/LO/LL Set by HH/PH/PL/LL etc…

MV high Limit set by parameter MH in Tuning Window

Output High Limit index pointer set by parameter OPHI in Tuning Window

Output Low Limit index pointer set by parameter OPLO in Tuning Window

MV low Limit set by parameter ML in Tuning Window

Tag Number is used to identify and call an instrument.

Tag Comment is used to indicate the service of the instrument.

Cascade mark indicates that the instrument is receiving its set point from another instrument.

Scale High of the instrument indicated by parameter SH in the Tuning window

Scale Low of the instrument indicated by parameter SL in the Tuning Window

Tag Mark — Mode — Alarm Status — Manipulated Variable Limits — Index Mark — Manipulated Variable (MV) — Index Mark — Manipulated Variable Limits

Tag Number — Tag Comment — Cascade Mark — Engineering Units — Scale — High - High Al... — Process High Alarm — Setpoint Variable (SV) — Process Variable (PV) — Scale

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Changing Parameters from Faceplate Window

Select here to display the Data Entry Box

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Changing Parameters from Faceplate Window

To change the displayed parameter value, type the new data value. Select Enter key.The new data value will be displayed.

Incase you want to change the parameter other than the one that is displayed in the data entry box, select ITEM icon. Type the parameter (Viz. HH/PH/LL/PL/MV etc…) to be changed.The current value of the parameter will be displayed in the data entry box. Type the new data value. Select Enter key. The new data value will be displayed.

DATA ENTRY BOX

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Tuning Window

Select this icon to display the Tool box

Select NAME icon. Type the TAGNAME

Select this icon to display the Tuning Window

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Tuning Window

9/30/2004 2:00 PM

FCS0101   RIGHT   Control

COPY

TI100 TUN

TI100

```
MODE=AUT              ALRM:NR
SH   :      100.0        HH   =        56.0
SL   :        0.0        PH   =       100.0
PV   =       25.0%       PL   =         0.0
SUM  :                   LL   =         0.0
                         VL   =       100.0
```

13:55   13:56   13:57   13:58   13:59

PV

TUNING WINDOW displays all the Tuning parameters of the instrument.

The Tuning Window is used to set up the alarm setting as well as the loop tuning parameters.

Only the parameters indicated with a "= " Can be changed.

Displaying a "Tuning Window"

1.Select **"NAME icon** in the **System Message Area"** then enter the **"TAGNUMBER"**. **Select the "Tuning " window icon from** the tool box.

2. Select **"NAME icon** in the **System Message Area"** then enter the **"TAGNUMBER TUN"**.

3.**Double click on a Tag's name** on a **"Control Window"** and the faceplate Window will appear. **Select the "Tuning window " icon from the tool box.**

Ready
00:05:36 100%

Start | System Vie... | Generation ... | Picot | Test Functio... | Microsoft Po... | TI100 TUN | 2:00 PM

YOKOGAWA ◆

Tuning Window Icons

9/30/2004 2:00 PM

FCS0101   RIGHT   Control

COPY

TI100 TUN

COPY

RESERVE

ACKNOWLEDGE

PAUSE

TIME AXIS MAGNIFICATION

DATA AXIS MAGNIFICATION

```
MODE=AUT              ALRM:NR
SH   :                H    .0
SL   :        0.0        PH   =       100.0
PV   _       25.0%       PL   =         0.0
SUM  :                   LL   =         0.0
                         VL   =       100.0
```

:55   13:56   13:57   13:58   13:59   14:00

PV

TI100

TT100

AUT
NR

PV   %
        25.0

MAN
NR

MV   %
        25.0

100.0
80.0
60.0
40.0
20.0
0.0

100.0
80.0
60.0
40.0
20.0
0.0

Ready
00:05:36 100%

Start | System Vie... | Generation ... | Picot | Test Functio... | Microsoft Po... | TI100 TUN | TT100 | 2:00 PM

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Tuning Window Icons

AOF
CALIBRATION
OPERATION MARK
DRAW
RAW

YOKOGAWA ◆

Changing Parameters from Tuning Window

Select the Parameter to be changed. The Data entry window appears. Type the data value. Select Enter key. The new data value will be displayed.

DATA ENTRY BOX

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Mode Status

MAN (Manual)

AUT (Auto)

CAS (Cascade)

PRD (Primary Direct)

Selecting MANUAL Mode

Select here to display the mode status window.

Select the MANUAL mode icon. Confirm. The instrument will go the MANUAL mode.

Selecting MANUAL Mode

In the dialog box:

LIC1 MAN
TANK LEVEL CTR

Name: TESTUSER

Reason:

CANCEL — (points to the X button)

CONFIRM — (points to the button)

MANUAL Mode

The instrument in MANUAL Mode.

In manual mode, the MV pointer appears in red colour and the SV pointer appears in yellow colour.

MV of the instrument can be changed by increment/ decrement keys or through data entry box.

The SV of the instrument can be changed either by set point change key or using ITEM and DATA in the data entry box.

Selecting AUTO Mode

Select here to display the mode status window.

Select the AUTO mode icon. Confirm. The instrument will go the AUTO mode.

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Selecting AUTO Mode

LIC1 AUT
TANK LEVEL CTR

Name: TESTUSER

Reason:

CONFIRM

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AUTO Mode

3/8/2007 3:24 PM

■ FIC1   TANK FLOW CTR   NR

GR0004

LIC1 TAN...

LIC1
TANK LEVEL C
TR

AUT
NR

| PV | MM |
| | 60.6 |

| SV | MM |
| | 60.0 |

| MV | % |
| | 60.4 |

The instrument in AUTO Mode.

In Auto mode, the SV pointer appears in red colour and the MV pointer appears in yellow colour.

SV of the instrument can be changed by increment/ decrement keys or through data entry box.

The MV of the instrument cannot be changed by any method.

Ready

Start | RM | Microsoft ... | System Vi... | Generatio... | Picot | Test Func... | 2 BKHP... | 3:24 PM

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Selecting CASCADE Mode

3/8/2007 3:44 PM

FIC1   TANK FLOW CTR   NR

GR0004   Input Window Name

FIC1   OK   Stn

FIC1 TAN...

FIC1
TANK FLOW CTR

AUT
NR

| PV | M3/H |
| | 60.0 |

| SV | M3/H |
| | 60.0 |

| MV | % |
| | 60.0 |

FIC1

Select the CAS mode icon. Confirm. The instrument will go the CASCADE mode.

Ready

Start | RM | Microsoft ... | System Vi... | Generatio... | Picot | Test Func... | 2 BKHP... | 3:44 PM

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Selecting CASCADE Mode

FIC1   TANK FLOW CTR   NR

3/8/2007 3:50 PM

GR0004

FIC1 TAN...

FIC1
TANK FLOW CTR

AUT
NR

PV	M3/H
	60.0

SV	M3/H
	60.0

MV	%
	60.0

100.0
80.0
60.0
40.0
20.0
0.0

FIC1 CAS
TANK FLOW CTR

Name: TESTUSER

Reason:

✕   🔖

CONFIRM

Ready

Start | RM | Microsoft ... | System Vi... | Generatio... | Picot | Test Func... | 2 BKHP... | 3:50 PM

YOKOGAWA ◆

CASCADE Mode

3/8/2007 3:56 PM

GR0004

FIC1 TAN...

FIC1
TANK FLOW CTR

CAS
NR

PV	M3/H
	60.0

SV	M3/H
	60.0

MV	%
	60.0

The instrument in CASCADE Mode.

100.0
80.0
60.0
40.0
20.0
0.0

In a **cascade** loop the output of the primary controller (MV1) goes as set point of the secondary controller (SV2). The **output of the secondary controller (MV2)** goes to the final control element. For a cascade loop, the primary controller can be in AUT or MAN mode, but the secondary controller has to be in CAS mode.

In cascade mode both the SV and MV pointers appear in yellow colour.

The SV and MV of the instrument cannot be changed.

Ready

(2) BKHPanel

Start | RM | Microsoft ... | System Vi... | Generatio... | Picot | Test Func... | 2 BKHPa... | 3:56 PM

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3/8/2007 4:00 PM

FIC1 TUN TANK FLOW CTR

Select the PRD icon.
Confirm. The instrument
will go the PRD mode.

FIC1 PRD ?
TANK FLOW CTR

Name: TESTUSER

Reason:

CONFIRM

FIC1
TANK FLOW CTR

CAS
NR

PV M3/H
60.0
SV M3/H
60.0
MV %
60.0

To select PRD mode:
Go to the tuning window of the Secondary controller.
Select PRD Icon. Confirm.

To select CASCADE mode:
Change the mode status of the secondary controller
to CAS.

FIC1 TANK FLOW CTR
MODE=CAS

SV = 60.0
MV = 60.0
DV : 0.0

Ready
00:05:36 100%

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3/8/2007 4:04 PM

FIC1 TUN TANK FLOW CTR

FIC1
TANK FLOW CTR

PRD
NR

PV
60.0
SV M3/H
60.0
MV %
60.0

The instrument in
PRD Mode.

**In a normal cascade mode the output of the primary
controller (MV1) goes as set point of the secondary
controller (SV2). The output of the secondary controller
(MV2) goes to the final control element.**

**In PRD mode the output of the primary controller (MV1)
directly goes to the final control element. The secondary
controller is bypassed and cannot be operated.**

PV SV MV

Ready
00:05:36 100%

Initialization Manual (IMAN) Mode

In a cascade loop, if the cascade is broken
by taking the secondary controller from CAS
to either AUT or MAN mode, IMAN appears
as the mode sub status of the primary controller.
IMAN indicates that
- Cascade loop is broken
- Primary controller is bypassed
- Primary controller cannot be operated due to
- SV tracking.

SV tracking:
The output of the primary controller (MV1) automatically
tracks the set point of the secondary controller (SV2)
to have bump less transfer to CAS mode.

To bring the primary controller out of IMAN mode
Change the mode status of the secondary controller
to CAS. The primary controller will automatically come
out of IMAN
mode.

The instrument in IMAN Mode.

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Instrument in IMAN Mode

LIC1 and FIC1 are in cascade. If FIC1 is
changed from Cascade to either Auto or
Manual mode, LIC1 goes to IMAN mode.

To bring LIC1 out of IMAN mode, change
the mode status of FIC1 to Cascade.
LIC1 will automatically come out of IMAN
Mode.

The instrument in IMAN Mode.

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MV Clamping Mode

CLAMPED POSITIVE

In auto mode, if MV of the instrument is increased beyond MH value, MV gets clamped at the MH value and C appears on the instrument faceplate .

MHI alarm also appears on the instrument as well as in the Process Alarm Window.

The MV and SV goes to clamp mode.

MV Clamping Mode

CLAMPED NEGATIVE

In auto mode, if MV of the instrument is decreased below ML value, MV gets clamped at the ML value and C appears on the instrument faceplate .

MLO alarm also appears on the instrument as well as in the Process Alarm Window.

The MV and SV goes to clamp mode.

Process Alarm Status

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ALARM STATUS	PROCESS STATUS	ALARM SETTINGS	ITEM TO BE SET IN THE TUNING PANEL	PV BAR COLOUR	TAG MARK COLOUR	REMARKS
NR	PROCESS NORMAL	----------	----------	GREEN	GREEN	----------
HH	PV VERY HIGH	PV > HH	HH	RED	RED	----------
HI	PV HIGH	PV > PH	PH	RED	RED	----------
LL	PV VERY LOW	PV < LL	LL	RED	RED	----------
LO	PV LOW	PV < PL	PL	RED	RED	----------
DV+ / -	DEVIATION ALARM	DV > DL DV = PV - SV	DL DEVIATION LIMIT	YELLOW	YELLOW	
VEL + / -	VELOCITY ALARM	VEL = ▲ PV/▲ T	VL VELOCITY LIMIT	YELLOW	YELLOW	
IOP + / -	INPUT OPEN	INPUT IS OUT OF RANGE	CHECK RAW VALUE IN TUNING WINDOW	RED	RED	RAW IS ACTUAL INPUT INTERMS OF %
OOP	OUTPUT OPEN	OUTPUT LINE IS OPEN		RED	RED	

Process Alarm Status

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ALARM STATUS	PROCESS STATUS	ALARM SETTINGS	ITEM TO BE SET IN THE TUNING PANEL	PV BAR COLOUR	TAG MARK COLOUR	REMARKS
MHI	MV HIGH	MV > MH	MH	YELLOW	YELLOW	OCCURS ONLY IN CAS/ AUTO MODE
MLO	MV LOW	MV < ML	ML	YELLOW	YELLOW	OCCURS ONLY IN CAS/ AUTO MODE

Alarm Sub Status – Alarm Output Off

3/8/2007 7:13 PM

.AL Process Alarm

1 ■ 3/8   6:50:08 PM LIC1   TANK LEVEL CTR

LIC1
TANK LEVEL CTR

MAN
HI

Instrument is in HI alarm.

PV   MM
            80.0
SV   MM
            92.9
MV   %
            80.0

Normally when an alarm occurs

➢ **The tag mark changes colour depending on the type of the alarm.**

➢ **Audible alarm is heard.**

➢ **The alarm status (HI/LO/HH/LL etc…) is displayed on the process alarm window.**

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Selecting / Deselecting AOF

3/8/2007 7:23 PM

LIC1 TUN TANK LEVEL CTR

LIC1 TANK LEVEL CTR
MODE=MAN

HH	=	100.0
➡ PH	=	70.0
PL	=	0.0
LL	=	0.0
VL	=	100.0
DL	=	100.0

AOF

LIC1 AOF ?
TANK LEVEL CTR

Name: TESTUSER

Reason:

✕   ☐

CONFIRM

LIC1
TANK LEVEL CTR

MAN
HI

PV   MM
            80.0
SV   MM
            92.9
MV   %
            80.0

To put the instrument to AOF mode:
Go to the tuning window of the instrument.
Select AOF icon. Confirm.

To bring the instrument back to normal mode:
Go to the tuning window of the instrument.
Select AOF icon once again. Confirm.

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Slide 1

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DataBase Equalize Complete

3/9/2007 12:33 AM

.AL Process Alarm

LIC1
TANK LEVEL C
TR

MAN
HI   AOF

PV
81

SV   MM
92.9

MV   %
81.8

100.0
80.0
60.0
40.0
20.0
0.0

HI alarm appears only on the instrument faceplate.

MH
ML

In AOF mode:

➢ The tag mark changes to dark blue colour irrespective of the alarm.

➢ Audible alarm is put off.

➢ The alarm status is displayed only on the instrument faceplate.

➢ All the alarms status except IOP & OOP on the Instrument are not displayed on the process alarm window.

00:05:36   100%

CS3000 O...   12:33 AM

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<June 22, 2007>

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Slide 2

Calibration (CAL)

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3/8/2007 7:36 PM

COPY

LIC1 TUN TANK LEVEL CTR

CAL   CAL

■ LIC1 TANK [CAL] CTR   ■ CAL

MODE=MAN   ALRM:NR

HH   =   100.0   MH   =   100.0

LIC1
TANK LEVEL C
TR

MAN
NR   CAL

PV   MM
80.0

SV   MM
92.9

MV   %
80.0

100.0
80.0
60.0
40.0
20.0
0.0

When an instrument is put in CAL mode

➢ CAL appears on the instrument faceplate.

➢ The PV bar changes to cyan colour.

➢ The Instrument automatically comes to MAN mode.

➢ The actual transmitter input is bypassed.

➢ PV of the instrument can be changed.

➢ All the alarms checking on the instrument are bypassed.

Ready

00:05:36   100%

Selecting/Deselecting CAL mode

To put an instrument in to CAL mode:
Go to the tuning window of the instrument.
Select CAL icon. Confirm.

To bring the instrument back to normal mode:
Go to the tuning window of the instrument.
Select CAL icon once again. Confirm.

Importance Level

Importance level is assigned to an instrument when it is created in the engineering builder. There are 8 importance levels.

1 - Important tag with confirmation   5 - Important tag without confirmation

2 - General tag without confirmation   6 - General tag with confirmation

3 - Auxillary tag –I without Confirmation   7 - Auxillary tag –I with Confirmation

4 - Auxillary tag –II without Confirmation 8 - Auxillary tag –II with Confirmation

Tag with confirmation

IMP-1 Important Tag Operation ?
IMPORTANCE 1

Name: TESTUSER
Reason:

CONFIRM

For tags with confirmation, any parameter to be changed would request for a confirmation. On selecting the confirm key, the new data will be accepted.

IMP-1 IMPORTANCE 1
MV = 0.0%   ITEM
DATA = 50

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Security Level

Security level is assigned to an instrument when it is created in the engineering builder. There are 8 security levels.

Tuning Parameters are displayed with = or : depending on the security level.
Parameters displayed with = can be changed in the current key position.
Parameters displayed with : cannot be changed in the current key position.

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Security Level

KEY POSITION/ ACCESS LEVEL	MONITORING FACEPLATE DISPLAY			OPERATION FACEPLATE OPERATIONS, PROCESS DATA INPUT OPERATIONS		
	OFF	ON	ENG	OFF	ON	ENG
1	O	O	O	O	O	O
2	O	O	O	*1	O	O
3	O	O	O	*2	O	O
4	O	O	O	X	O	O
5	O	O	O	X	X	X
6	X	O	O	X	X	O
7	X	X	O	X	X	X
8	X	X	X	X	X	X

O : Can be executed

X : Cannot be executed

*1 : Only the PV alarm settings, SV, MV and block mode can be changed

* 2 : Only the SV, MV and block mode can be changed

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Security Function

Error Message prompt

14/09/2005 12:05 AM

Select this icon to call the user login window

When you have logged in as an OFF USER , and if the security level of the instrument is high, an error message prompt as indicated in the screen will be displayed.

Your security level is not allowed to operate GSP-I-PIC-500A.MV.

User Login Window to change the users

User Information
User   OFFUSER(Default OFF User)
Group   DEFGRP(Default User Group ALL)
Since   14/09/2005 12:04 AM

User Name   OFFUSER

Password

Change Password   User In   User Out   Cancel

MV = 50.0%
DATA = 10

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Hard Copy

COPY

COPY is used to copy the windows on to the printer or to a file in the HIS.

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Acknowledge

ACKNOWLEDGE

ACKNOWLEDGE is used to acknowledge the alarms in the HIS.

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Reserve

9/30/2004 2:00 PM

FCS0101   RIGHT   Control

TI100 TUN

■ TI100

MODE=AUT   ALRM:NR

RESERVE

SH	:	100.0	HH =	56.0
SL	:	0.0	PH =	100.0
PV	=	25.0%	PL =	0.0
SUM	:		LL =	0.0
			VL =	100.0

Generally the trend is displayed on the Tuning window only from the time the tuning window is displayed on the HIS.

RESERVE is used to reserve the previous trend waveform on the Tuning window.

14:00

PV

Ready   00:05:36   100%

Start | System Vie... | Generation ... | Picot | Test Functio... | Microsoft Po... | TI100 TUN | TT100 | 2:00 PM

YOKOGAWA

Tuning Window Icons

9/30/2004 2:00 PM

FCS0101   RIGHT   Control

TI100 TUN

■ TI100

MODE=AUT   ALRM:NR

DATA AXIS MAGNIFICATION

TIME AXIS MAGNIFICATION

PAUSE

SH	:	100.0	H	
SL	:	0.0	PH =	100.0
PV	=	25.0%	PL =	0.0
SUM	:		LL =	0.0
			VL =	100.0

PAUSE is used to freeze the Tuning trend display. The recording would continue.

TIME AXIS MAGNIFICATION is used to magnify or reduce the time axis in the Tuning trend.

DATA AXIS MAGNIFICATION is used to magnify or reduce the data axis in the Tuning trend.

:55   13:56   13:57   13:58   13:59

PV

Ready   00:05:36   100%

Start | System Vie... | Generation ... | Picot | Test Functio... | Microsoft Po... | TI100 TUN | TT100 | 2:00 PM

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Operation Mark

OPERATION MARKS are labels that can be fixed on various instruments.

Operation Marks are created in the HIS Set up Window.

64 Operations marks can be defined for one HIS.

One operation mark can be assigned to many instruments.

One instrument can have only one operation mark at a time.

Operation Mark Assignment

Control Drawing Display

DRAW is used to display the control drawing related to the instrument. The same can also be called by typing **TAGNO DRAW** on selecting the **NAME** icon

PROJECT: BUNDUQ - GAS REINJECTION PROJECT   SIMPLE CONTROLLERS
JOB CODE: BG9

INJCTION GAS TO ARAB D   INJCTION GAS TO ARAB C   PRODN SEPRTRPR CTL>GDU
0-7250 PSI G   0-38500 LBS/HR   0.0-580.0 PSI G
CONTROL ACTION : .DIR.   CONTROL ACTION : .DIR.   CONTROL ACTION : .DIR.

CONTACTOR   CNDNSOR LVL
0.0-100.0   %
CONTROL ACTION : .DIR.

AIR COOLER   TEG OUTLET   SUPPLY GAS   SCRB TEG O/L   FLASH DRUM   TEG LEVEL
32.0-212.0 DEG F   0.0-100.0   %   0.0-100.0   %
CONTROL ACTION : .DIR.   CONTROL ACTION : .DIR.   CONTROL ACTION : .DIR.

Raw Value

FIC1 TANK FLOW CTR

MODE=CAS   ALRM:
SH   :   100.0   RAW =   81.757881
SL   :   0.0
PV   =   81.8M3/H   PL   =   0.0   P
SV   =   81.8M3/H   LL   =   0.0   I
MV   =   81.8%   VL   =   100.0   D
                                                  GW

RAW is actual input in terms of %.
PV is actual input in terms of engineering unit.
Check RAW value when an instrument goes to IOP condition.

Control Group Window

vigilance.

Select this icon to display the Tool box

Select this icon to display the Control Group Window

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Control Group Window – 8 Instruments

vigilance.

Control group windows are used to display multiple instrument faceplates.

Maximum 8 or 16 instrument faceplates can be displayed in one Control Group Window

Normally the instruments are monitored and operated from this window.

Double click on the instrument **TAGNUMBER** to **display the Faceplate window** of the instrument.

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8 Instrument Control Group operation

Data Entry Box is used to do the data entry.

Select the instrument soft key to display the Data Entry Box

Control Group Window – 16 Instruments

16 instruments can also be displayed in a Control Group Window.

16 Instruments Control Group Operation

To operate instruments from this window, Double click on the instrument TAGNAME to display the faceplate window of the instrument.

Operate the instrument from the instrument faceplate window.

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Assigning Instruments

INSTRUMENT ASSIGNMENT

Faceplate Assignment

1.	PGL13	9.	
2.	PGPID	10.	
3.	PGDLAY	11.	
4.		12.	
5.		13.	
6.		14.	
7.		15.	
8.		16.	

OK   Cancel

Select the **INSTRUMENT ASSIGNMENT** icon to assign instruments in a Control Group Window.
These are temporary assignments.
They will be retained till the HIS is not powered Off.
Once the HIS is powered Off and On again, the instruments that were assigned in the engineering builder will be displayed.

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Trend Window

Select this icon to display the Tool box

Select this icon to display the Trend Window

Trend Window

TREND WINDOW records the PV, SV and MV of various instruments.

Trend can be displayed in **Trend Group** Format or in **Trend Point** Format.

Maximum 8 pens can be assigned in **one Trend Group Window**

Rotary Trend:

Trend is recorded continuously in a rotary buffer. When the storage buffer becomes full, old trend data is overwritten by the new trend data. The trend is recorded continuously, once the pens are assigned.

Batch Trend:

Batch trend is used for a Batch Process. The trend has to be started and stopped whenever required, through an external command. Whenever start command is given, it erases the old recorded trend completely and starts recording the new trend.

⇢Trend Recording Span

The total trend recording period in a trend window depends on the sampling period and number of samples collected per pen.

Sampling Period: The time difference between two consecutive samples recorded.

SAMPLING PERIOD	TOTAL RECORDING TIME (2880 Samples/Pen)
1 sec.	48 mins.
10 secs.	480 mins. (8 hours)
1 min.	48 hours (2 days)
2 mins.	96 hours (4 days)
5 mins.	240 hours (10 days)
10 mins.	480 hours (20 days)

Trend Blocks

TREND BLOCKS:

Trend Windows are divided into 20 trend blocks. Each trend block consists of 16 trend groups. 50 Trend Blocks are available per HIS.

20 Blocks – Used for self HIS (Out of 20 blocks , 18 Blocks can be used for trend recording)

50 Blocks

30 Blocks – Used to view the trend recorded on other HIS

The trend recorded on one HIS can be viewed on other HIS if both the HIS are connected using the Ethernet cable.

Each trend window is called by the trend block number followed by trend group number.

Syntax for calling Trend Windows

TGbbgg bb-Trend Block number, gg – Trend Group number

(e.g. TG0101 Represents Trend Block 01 Trend Group 01 &

TG2014 represents Trend Block 20 Trend Group 14)

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Trend Group Window

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Trend Point Window

Double click here to call the Trend Point Window

Trend Point Window

YOKOGAWA ◆

Trend Pen Assignment

PEN ASSIGNMENT

Select the **PEN ASSIGNMENT** icon to assign pens in a Trend Window. These are temporary assignments. They will be retained till the HIS is not powered Off.
Once the HIS is powered Off and On again, the trend pens that were assigned in the engineering builder will be displayed.

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Trend Save

TREND SAVE

Call the Trend window to be saved.
Select TREND SAVE icon. Specify the file name.
Confirm. The trend window will be saved.

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Trend Retrieve

TREND RETRIEVE

To retrieve the saved trend, select TREND RETRIEVE icon.
Select the trend window file to be retrieved.
Select Open. The saved trend window will be displayed.

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Calling Instrument from Trend Window

Double click here to call the Instrument faceplate Window

Instrument Faceplate Window. Instrument can be operated from this window.

Process Alarm Window

Select this icon to call the Process Alarm Window

PROCESS ALARM WINDOW displays the latest 200 process alarms.

Alarms can be acknowledged either as a **Group** or as **Individual** alarm.

When the number of alarms exceed 200, old alarms are overwritten by new alarms.

Process Alarm Window

9/30/2004 2:06 PM

TI200   HI

.AL Process Alarm

```
9/30  2:06:03 PM  TI200                    HI
9/30  05:20 PM  TI100                      LO
```

This icon displays the current PV Values of the instruments that are in alarm

This icon blinks in red colour when there are unacknowledged process alarms.

This icon is green if there are no Process alarms.

This icon is used to acknowledge the process alarms.

This icon displays the important tags (High Priority Alarms) that are in alarm.

Ready   Range:All   Type:All   2/2

Start | System Vie... | Generation ... | Picot | Test Functio... | Navigator \... | Microsoft Po... | .AL Proces... | 2:06 PM

YOKOGAWA ◆

Alarm Occurrence

9/30/2004 2:06 PM

TI200   HI

.AL Process Alarm

```
1   9/30  2:06:03 PM  TI200                  HI
2   9/30  2:05:20 PM  TI100                  LO
```

Select this icon to call the Process Alarm Window

When an alarm occurs

➢ **The tag mark changes colour depending on the alarm and starts flashing.**

➢ **The Process alarm window icon starts flashing in the System Message Area.**

➢ **Audible alarm is activated.**

➢ **The LED on the Process Alarm Window Key on the Operator Keyboard starts flashing.**

➢ **The alarm status is displayed on the instrument faceplate as well as on the Process Alarm Window.**

➢ **The alarm is printed on the printer connected to the HIS.**

➢ **The alarm is also stored in the History.**

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Operator Action


```
TI200                          HI                        9/30/2004 2:06 PM
```

.AL Process Alarm

```
1   9/30  2:06:03 PM  TI200                    HI
2   9/30  2:05:20 PM  TI100                    LO
```

Select this icon to call the Process Alarm Window

Actions to be taken by the operator

➤ **Select the Process Alarm Window icon in the System Message Area or Select the Process Alarm Window key on the Operator Keyboard.**

➤ **Acknowledge the alarm by the Alarm Acknowledge key. The instrument tag mark stops flashing.**

➤ **Reset the audible alarm using Buzzer Reset Key.**

➤ **Double click the process alarm in the Process Alarm Window for which action needs to be initiated.**

➤ **Take corrective action to reset the alarm.**

➤ **The alarm disappears from the Process Alarm window once it is reset.**

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Operator Guide Message Window


```
DataBase Equalize Complete                               10/1/2004 10:57 AM
```

.OG Operator Guide Message

```
1  10/1  10:57:36 AM
     BATCH OVER
2  10/1  10:57:28 AM
     COOLING STARTED
3  10/1  10:57:16 AM
     REACTION STARTED
4  10/1  10:57:07 AM
     HEATING STARTED
5  10/1  10:56:57 AM
     BATCH STARTED
```

Select this icon to call the Operator Guide Message Window

OPERATOR GUIDE MESSAGE WINDOW displays the predefined messages to guide the operator regarding the current process status and /or the actions to be taken.

OG messages can be acknowledged either as a **Group** or as **Individual** message.

```
Ready
Start | System View (... | Generation Me... | Picot | Test Function -... | .OG Operator ...          10:57 AM
```

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Operator Guide Message Occurrence

Select this icon to call the Operator Guide Message Window

```
1  10/1  10:57:36 AM
   BATCH OVER
2  10/1  10:57:28 AM
   COOLING STARTED
3  10/1  10:57:16 AM
   REACTION STARTED
4  10/1  10:57:07 AM
   HEATING STARTED
5  10/1  10:56:57 AM
   BATCH STARTED
```

When an Operator Guide Message occurs occurs

➢ The Operator Guide Message icon in the System Message Area as well as the LED in the Operator Guide Message key on the Operator Keyboard starts flashing.

➢ The operator guide message is displayed in the OG window.

➢ Audible alarm is activated.

➢ The OG message is printed on the printer connected to the HIS if it configured for printing.

➢ The OG message is also stored in the History.

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Operator Action

Select this icon to call the Operator Guide Message Window

```
1  10/1  10:57:36 AM
   BATCH OVER
2  10/1  10:57:28 AM
```

Actions to be taken by the operator

➢ Select the OG Message icon in the System Message Area or Select the OG key on the Operator Keyboard.

➢ Acknowledge the message by the Alarm Acknowledge key. The head mark on the OG message stops flashing.

➢ Reset the audible alarm using Buzzer Reset Key.

➢ Double click the OG message on the OG Window for which action needs to be initiated. The related window will appear as per the setting done in the HIS Setup menu.

➢ Take the necessary action.

➢ Delete the OG message by the Delete key in the OG window. OG messages cannot be deleted if they are not acknowledged.

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Graphic Window

Select this icon to display the Tool box

Select this icon to display the Graphic Window

Overview Window

Select this icon to display the Tool box

Select this icon to display the Overview Window

Overview Window

Overview Window displays the overview of the current process status.

Information regarding the process is distributed among the various display blocks.

32 Display Block s per Overview Window.

Each block gives dynamic information regarding the process.

Double click on the display block to more details.

3 Types of Display Blocks

- **Single Tag Block**
- **Window Display Block**
- **Comment Block**

Overview Window

Double click on the display blocks to display more details.

9/30/2004 1:56 PM

FCS0101   RIGHT   Control

.PR Process Report

Tag Name	Tag Comment	Alarm	Current Value	Mode	Operatio...	System Tag Name
SW			0			.SW0201S0101
TT100		NR		MAN		.BL0321S010101
TI100		NR	0.0 %	AUT		.BL0322S010101
TT200		NR		MAN		.BL0323S010101
TT300		NR		MAN		.BL0324S010101
TT400		NR		MAN		.BL0325S010101
TT500		NR		MAN		.BL0326S010101
TT600		NR		MAN		.BL0327S010101
TT700		NR		MAN		.BL0328S010101
TT800		NR		MAN		.BL0329S010101
TI200		NR	0.0 %	AUT		.BL0330S010101
TI300		NR	0.0 %	AUT		.BL0331S010101
TI400		NR	0.0 %	AUT		.BL0332S010101
TI500		NR	0.0 %	AUT		.BL0333S010101
TI600		NR	0.0 %	AUT		.BL0334S010101
TI700		NR	0.0 %	AUT		.BL0335S010101
TI800		NR	0.0 %	AUT		.BL0336S010101
LC100		NR	0.0 %	MAN		.BL0337S010101

Process Report displays the current status of all the instruments

END   "TAG" DEFAULT   "I/O" FCS0101 %SW

Start | System View (C... | Generation Mes... | Picot | Test Function - ... | Microsoft Powe... | .PR Process Re... | 1:56 PM

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9/30/2004 1:57 PM

FCS0101   RIGHT   Control

Historical Report - [Operation and Monitoring Message]
File   Edit   View   Window   Help

Message No	Date	Message Text					
1101	8/3/2004 10:28:00 AM	LIC-111	PV =	20.0 %	LO		
1106	8/3/2004 10:27:02 AM	LIC-111	NR				
1102	8/3/2004 10:27:02 AM	LIC-111	PV =	20.0 %	LO	Recover	
1101	8/3/2004 10:26:54 AM	LIC-111	PV =	20.0 %	LO		
1106	8/3/2004 10:25:19 AM	LIC-111	NR				
1102	8/3/2004 10:25:19 AM	LIC-111	PV =	20.0 %	LO	Recover	
1101	8/3/2004 10:23:25 AM	LIC-111	PV =	20.0 %	LO		
1106	8/3/2004 10:23:06 AM	LIC-111	NR				
1102	8/3/2004 10:23:06 AM	LIC-111	PV =	20.0 %	LO	Recover	
1101	8/3/2004 10:22:48 AM	LIC-111	PV =	20.0 %	LO		
1106	8/3/2004 10:22:25 AM	LIC-111	NR				
1104	8/3/2004 10:22:25 AM	LIC-111	MV =	100.0 %	MHI	Recover	
1102	8/3/2004 10:22:14 AM	LIC-111	PV =	20.0 %	DV-	Recover	
			PV =	20.0 %	LO	Recover	
			PV =	55.0 %	HI		
			PV =	20.0 %	LO		
			MV =	80.0 %	MHI		
			MV =	22.1 %	MLO	Recover	
			MV =	13.6 %	MLO		
			PV =	55.0 %	DV-		
			PV =	55.0 %	DV+	Recover	
			PV =	55.0 %	DV+		

Historical Message Report stores the following events

➢**Process Alarms**

➢**Annunciator Messages**

➢**Operator Guide Messages**

➢**Operation Record**

22 Items Found

Microsoft Po... | .PR Process... | Historical Re... | 1:57 PM

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Navigator Window

Select this icon to display the Navigator Window

FCS0101   RIGHT   Control

9/30/2004 2:02 PM

Navigator \USER

USER
- CG0001
- GR0001
- OV0001
- TG0101
  - TG0102
  - TG0103
  - TG0104
  - TG0105
  - TG0106
  - TG0107
  - TG0108
  - TG0109
  - TG0110
  - TG0111
  - TG0112
  - TG0113
  - TG0114
  - TG0115
  - TG0116
  - TG0201
  - TG0301
  - TG0401
  - TG0501
  - TG0601
  - TG0701
  - TG0801
- SYSTEM
  - .AL
  - .OG
  - .SO
  - .PR
- PRODUCT

Name	Comments	Type
CG0001		Control
GR0001		Graphic
OV0001		Overview
TG0101	Block:01 Group:01	Trend
TG0201	Block:02 Group:01	Trend
TG0301	Block:03 Group:01	Trend
TG0401	Block:04 Group:01	Trend
TG0501	Block:05 Group:01	Trend
TG0601	Block:06 Group:01	Trend
TG0701	Block:07 Group:01	Trend
TG0801	Block:08 Group:01	Trend

Navigator window displays the index of all the System defined windows and user defined windows along with their dynamic status. Any window can be called from the Navigator Window.

Start | System View (C... | Generation Mes... | Picot | Test Function - ... | Microsoft Powe... | Navigator \U... | 2:02 PM

YOKOGAWA

Screen Mode (Window or Full Screen)

DataBase Equalize Complete

14/09/2005 4:26 AM

GR0001 PRODUCTION SEPARATOR

GR0001   PRODUCTION SEPERATOR

FULL SCREEN MODE

GR0002 GDU-DEHYDRATION UNIT

WINDOW MODE

GDU-DEHYDRATION UNIT

COND.FRM COMP.SCRUB

BYPASS DRUM

ACID GAS COMP. DISQ

The windows can be viewed in Full screen mode or in Window Mode

GSP-DV-01 PRODUCTION SEPARATOR

Ready

PFD/OVPLANT | INDEX | LEGENDS | CONTROL GROUP | TREND GROUP | ALARM SUMMARY | SOE | SYSTEM VIEW

Ready

Start | S... | G... | P... | T... | T... | O... | S... | C... | C... | E... | M... | h... | C... | G... | 4:26 AM

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Full Screen Mode

Window Mode

Panel Set

Panel Set is automatic setting of predefined windows on the HIS.

> **200 panel sets can be programmed for one HIS.**

> **Each panel set can set up to 5 Windows.**

> **Panel sets are created in HIS Engineering Builder.**

Panel Sets can be activated by

> **Preset Menu**

> **Function Key on the Operator Keyboard**

> **Touch Target or Push Button in Graphic Window**

> **Sequence Table through Sequence Message Request**

Panel Set

Calling Panel Set through Preset Menu

Select PRESET MENU

Select PANEL SET from the PRESET MENU Icon.

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Dynamic Window Set

SLAVE

MASTER

SLAVE

SLAVE

Dynamic Window Sets are set of windows can be programmed to be viewed simultaneously using Dynamic Window Set utility. One window can be selected as the Master and the rest would be Slave windows. Whenever the Master window is called, the slave windows automatically appear on the HIS.

Master window name will be suffixed with M and slave window names will be suffixed with S

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Save / Delete Window Set

To save Dynamic Window Set
Call the windows to be set on the HIS.
Select the Master Window.
Select the Dynamic Window Set Key.
The windows will be saved as a dynamic window set.

To delete Dynamic Window Set
Call the windows to be set on the HIS.
Select the Master Window.
Select the Dynamic Window delete Key.

DELETE DYNAMIC WINDOW SET

SAVE DYNAMIC WINDOW SET

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Digital Inputs (DI)

System Code : %ZnnusccSddss

%Z - Process Input/Output   **S   - Station**

nn - node number   **dd - Domain number**

u   - I/O unit number   **ss - Station number**

s   - Slot number

cc - Channel number

Digital Inputs are contact inputs from field to CS3000.

Digital Inputs are used to indicate the

i) ON / OFF status of pumps, motors, heaters, etc.

ii) OPEN / CLOSE status of on-off valves.

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Digital Input Tuning Window

PV=1 Indicates contact is closed in field

PV=1
DI=ON

PV=0
DI=OFF

PV=0 indicates contact is open in field

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Digital Outputs (DO)

System Code : %ZnnusccSddss

%Z - Process Input/Output   S   - Station

nn - node number   dd - Domain number

u   - I/O unit number   ss - Station number

s   - Slot number

cc   - Channel number

Digital Outputs are contact outputs from CS3000 to field.
Digital Outputs are used to
i) Switch ON / OFF pumps, motors, heaters etc
ii) OPEN / CLOSE on-off Valves.

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Digital Output Tuning Window

PV=1 Indicates output relay is energized

PV=1 DO=ON

PV=0 DO=OFF

PV=0 indicates output relay is de energized

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Switches (SW)

Switches are classified into Global switches and Common Switches.

Global Switches
Global Switches are common to all FCS. The status of global switches are transmitted to other FCS through link transmission. Hence they can be set and referred in any FCS.

Common Switches
Common Switches are used to within the FCS. They are specific to each FCS.

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Global Switches (GS) & Common Switches (SW)

FCS0101   Online Download Complet

CG0004

SW1   SW2   SW3   SW4

PV 1   PV 0   PV 1   PV

ON   ON   ON   ON

OFF   OFF   OFF   OFF

Ready

Global Switches

Max.256 GS/FCS

System Code: %GSxxxxSddss
%GSxxxx - Switch number (0001 - 0256)
dd   - Domain number
ss   - Station number

Common Switches

Max.4000 SW/FCS

System Code: %SWxxxxSddss
%SWxxxx - Switch number (0001 - 4000)
 dd   - Domain number
 ss   - Station number

Switches are used to store intermediate variables in the

 interlocks. Switches are internal flags that can be set and

reset whenever required.

Switches are used for auto / man selection, pump selection,

speed selection, bypass selection etc..

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Switches Tuning Window

3/9/2007 4:20 PM

FCS0101   Online Download Complete Area = 1

SW2 TUN

Input Window Name

SW2 TUN   OK   Stn

SW2

PV   =   1

SW2

PV   1

6:15   16:16   16:17   16:18   16:19   16:20

PV

ON   PV=1
SW=ON

OFF   PV=0
SW=OFF

Ready   00:05:36   100%

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Timer (TM)

3/9/2007 4:28 PM

FCS0101 Online Download Complete Area = 1

TIMER21 TUN

Input Window Name

TIMER21 TUN   OK   Stn

```
■ TIMER21
   MODE=AUT          ALRM:NR              BSTS:STOP
   PV    =      OS        PH    =     100000
   DV    :       0        PL    :          0
                          DL    =          0
```

TIMER21

AUT   STOP
NR

TIME   S
         100000
              0

◆

Timers are used to introduce time delays in Sequence Table.

Second timer

Timer Types

Minute timer

PH = Maximum time the timer should count

PV = Actual time the timer has counted

DV = PH-PV i.e.the time left to finish counting

DL = Deviation limit

Microsoft Powe...   TIMER21 TUN   4:28 PM

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Timer Tuning Window

3/9/2007 4:28 PM

FCS0101 Online Download Complete Area = 1

TIMER21 TUN

Input Window Name

TIMER21 TUN   OK   Stn

START   STOP   PAUSE   RESUME

```
■ TIMER21
   AUT           ALRM:NR              BSTS:STOP
   PV    =      OS        PH    =     100000
   DV    :       0        PL    :          0
                          DL    =          0
```

TIMER21

AUT   STOP
NR

TIME   S
         100000
              0

◆

Timer Operation

1. When the timer is started, PV starts incrementing automatically

• ⟶ Alarm status is NR

2. When the timer has finished timing, i.e. when PV = PH

⟶ Block status is CTUP

3. When the timer is stopped while timing ⟶ Block status is STOP

4. When the timer is paused while timing ⟶ Block Status is PAUS

5. When the DV < DL ⟶ Block status is PALM

Any of the alarm status can be referred in sequence table as a condition

signal.

Ready

Start   System View (C...   Generation Mes...   Picot   Test Function - ...   Microsoft Powe...   TIMER21 TUN   4:28 PM

YOKOGAWA ◆

Counter (CTS/CTP)

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vigilance.

3/9/2007 5:39 PM

DataBase Equalize Complete

COUNTER TUN

Input Window Name

COUNTER TUN   OK Stn

COUNTER

MODE=AUT   BSTS:STOP
PV   =   0   PH   =   100000
DV   :   0   PL   :   0
                        DL   =   0

COUNTER

AUT   STOP

COUNT
        100000
             0

Counter is used to count internal events or external pulses. Counter PV updates by one every time the counter is started

CTS – Internal Counter

Counter types

CTP - Pulse counter

Counter operation is same as timer except that pause option is not available.

Ready

Start ... osoft Powe... 2 BKHPanel 5:39 PM

YOKOGAWA ◆

Message (AN)

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3/9/2007 5:47 PM

AN0002 TUN TANK LEVEL IS LOW

Input Window Name

AN0002 TUN   OK Stn

AN0002 TANK LEVEL IS LOW
               ALRM:NR
PV   =   0

AN0002
TANK LEVEL I
S LOW

NR
PV
             0

ON

OFF

Annunciator messages are user defined alarms. Annunciator messages are also activated through sequence table on a specific condition.

Annunciator messages appear on Process Alarm Window.
System Code: %ANxxxxSddssaa

46   17:47

Ready   00:05:36 100%

Start ... System View (C... Generation Mes... Picot Test Function - ... Microsoft Powe... 3 BKHPanel 5:47 PM

YOKOGAWA ◆

Annunciator Tuning Window

ANNUNCIATOR MESSAGE

ANNUNCIATOR MESSAGE

AN0002 TANK LEVEL IS LOW ALM

AN0002 TUN TANK LEVEL IS LOW

AN0002 TANK LEVEL IS LOW

ALRM:ALM

PV = 1

.AL Process Alarm

When an annunciator is activated, the annunciator messages appear on the System Message Area as well as on the Process Alarm Window. Once acknowledged it disappears from the System Message Area.

When the annunciator resets, the annunciator messages disappear from Process Alarm Window.

AN0002 TANK LEVEL IS LOW ALM PV 1 ON OFF

3/9/2007 5:49 PM

Ready Range:All Type:All 1/1

Ready

Start | System View (C... | Generation Mes... | Picot | Test Function - ... | Microsoft Powe... | 4 BKHPanel | 5:49 PM

YOKOGAWA ◆

Sequence Instruments (SIO)

3/9/2007 6:37 PM

PUMP TUN FEED PUMP SIO

Input Window Name

PUMP TUN | OK | Stn

PUMP FEED PUMP SIO

MODE=MAN   ALRM:NR   BSTS:NR

PV   =   2   MTM

MV   =   2   SIMM

⇒ BPSW

PUMP FEED PUMP SIO
MAN   NR
NR
PV   2
MV   2
ON
OFF

Sequence instruments (or) status input

output instruments are used to

i) Switch ON/OFF motors, pumps, heater etc..

ii) OPEN / CLOSE on-off valves

iii) Indicate the ON/OFF status of motors, pumps, heaters etc.

iv) Indicate the OPEN/CLOSE status of on-off valves.

Ready

Sta... | Function - ... | PUMP TUN FEE... | 6:37 PM

YOKOGAWA ◆

SIO Normal Operation

MV is referred as the output signal of the SIO

PV is referred as the answerback signal of the SIO

<u>Normal operation of SIO</u>

When MV =2, DO is ON, If DI is ON PV=2

When MV =0, DO is OFF, If DI is OFF PV=0

Alarm Status is NR in the above conditions

YOKOGAWA ◆

SIO Abnormal Operation – ANS+ Alarm

<u>Abnormal operation of SIO</u>

When MV =2, DO is ON, If DI is OFF then PV=0

Alarm Status is ANS+ in the above conditions

YOKOGAWA ◆

SIO Abnormal Operation – ANS- Alarm

Abnormal operation of SIO

When MV =0, DO is OFF, If DI is ON then PV=2

Alarm Status is ANS- in the above conditions

Interlocks

Interlocks for a process can be written in the form of Sequence Tables (ST) or Logic Charts (LC).

PROCESS

SEQUENCE TABLE

LOGIC CHART

Sequence Tables

| RULES | COLOUR BAND | CONDITIONS | ACTIONS |

Calling Sequence Table from Tuning Window

Select this icon to display the Sequence Table

Calling Sequence Table from NAME Icon

Logic Charts

Calling Logic Chart from Tuning Window

Select this icon to display the Logic Chart

Calling Logic Chart from NAME Icon

System Status Window

Select this icon to Display the System Alarm Message Window.

Select this icon to Display the System Status Overview Window.

Select the individual FCS icon to display the FCS card Status Window.

FCS Status Display Window

Select the node to display the status of individual I/O cards.

Time Setting Window

Select this icon to display the Time Setting Window.

System Alarm Window

Select this icon to display the System Alarm Window

```
1  0451 9/30  1:51:29 PM  FCS0101  RIGHT   Control
2  0001 9/30  1:51:29 PM  FCS0101  RIGHT   Manual Reset Start
3  0011 9/30  1:51:29 PM  FCS0101  RIGHT   Fail (SW STOP   Code= 0000 0000 0000 0000)
4  0304 9/30  1:51:25 PM  FCS0101  Recover
5  0303 9/30  1:50:38 PM  FCS0102  Fail
6  0303 9/30  1:50:38 PM  FCS0101  Fail
7  0238 9/30  1:50:37 PM  HIS Start ( Virtual )
```

SYSTEM ALARM WINDOW displays the latest 100 system alarms.

Alarms can be acknowledged either as a Group or as Individual alarm.

Calling System Alarm Window from Tool Box

Select this icon in the Tool Box to display the System Alarm Window

---

Virtual test Function for Simulation

TEST FUNCTION

SYSTEM GENERATION FUNCTION

OPERATION & MONITORING FUNCTION

CONTROL FUNCTION FUNCTION

SFCS

HUMAN INTERFACE STATION

System Message Window Icons

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9/30/2004 4:34 PM

DataBase Equalize Complete

GR0001 [M]

PRESET MENU   **CIRCULATE**   **CLEAR SCREEN**   **BUZZER RESET**

Tool Box

SYS HELP

Overview
Process Alarm
Operation Guide
Control
Tuning
Trend
Graphic
SYS System Status Display

Process Report
Historical Report
Image
Archive/Retrieve...
Logging Report Package
Recipe View
Activate System View

PRESET MENU can be used to carry out various functions that are defined in the Preset Menu option in the HIS Set Up menu.

CIRCULATE is to switch between engineering windows and the operation windows on the HIS if they are opened simultaneously.

CLEAR SCREEN is to clear all the operation displays on the HIS.

BUZZER RESET is to reset the BUZZER of the HIS.

...eneration ... | Picot | Test Functi... | GR0001 [M] | Windows

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YOKOGAWA ◆

Message Monitor Window

A Yokogawa Commitment to Industry
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PID11   FLOW CONTROLLER   HH

Message Monitor

Select this icon to display the MESSAGE MONITOR window

MESSAGE MONITOR WINDOW displays the latest 100 messages as configured in the Message Registration Window. Messages can also be filtered using the filter option.

Specific colours can be chosen for each type of message.

Header   Message

●	1	1601 3/14 11:23:32 AM	PID11	FLOW CONTROLLER				
●	2	1601 3/14 11:23:16 AM	MLD11					
●	3	1101 3/14 11:23:07 AM	PID11	FLOW CONTROLLER				
●	4	1101 3/14 11:23:07 AM	PID11	FLOW CONTROLLER	PV = 135.3 KG/M3	HI		
●	5	1101 3/14 11:23:07 AM	PID11	FLOW CONTROLLER	PV = 135.3 KG/M3	PV+		
●	6	1106 3/14 11:23:04 AM	PID11	FLOW CONTROLLER	NR			
●	7	1102 3/14 11:23:04 AM	PID11	FLOW CONTROLLER	PV = 31.3 KG/M3	LO	Recover	
●	8	1601 3/14 11:22:59 AM	PID11	FLOW CONTROLLER	PL = 0.0 KG/M3	old=	40.0	[TE...
●	9	1101 3/14 11:22:44 AM	PID11	FLOW CONTROLLER	PV = 0.0 KG/M3	LO		
●	10	1601 3/14 11:22:42 AM	PID11	FLOW CONTROLLER	PL = 40.0 KG/M3	old=	0.0	[TE...
●	11	1101 3/14 11:22:27 AM	IMP-1	IMPORTANCE 1	PV =			US...
●	12	1601 3/14 11:22:26 AM	IMP-1	IMPORTANCE 1	PL =			US...
●	13	1601 3/14 11:22:18 AM	IMP-1	IMPORTANCE 1	PH =			US...

Message Registration

Maximum Number Of Line: 100

Color
☑ Sequence Messages   red
☑ Operation Messages   green
☑ Field Bus Messages   magenta
☑ All Messages   orange
☐ Details

OK   Cancel   Apply

Filter

Station range
◉ All
○ FCS   FCS0101
○ My Station

Strings
☐ validate

Close

Ready   range:All   13/13

Start | System Vi... | Generatio... | Picot | Test Funct... | Microsoft ... | GR0004 | Message ...   11:32 AM

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YOKOGAWA ◆

Window Call Icon

WINDOW CALL

- # Overview
- Process Alarm
- Operation Guide
- Control
- Tuning
- Trend
- Graphic
- SYS System Status Display
- Process Report
- Historical Report
- Image
- Archive/Retrieve...
- Logging Report Package
- Recipe View
- Activate System View

WINDOW CALL icon is to call windows on the HIS

3/14/2007 11:45 AM

!IMP-1   LO

.AL Process Alarm

1	!3/14	11:42:27	AM	IMP-1	IMPO
2	3/14	11:23:07	AM	PID11	FLOW
3	3/14	11:23:07	AM	PID11	FLOW
4	3/14	11:23:07	AM	PID11	FLOW
5	3/14	11:23:04	AM	PID11	FLOW
6	3/14	11:23:04	AM	PID11	FLOW
7	3/14	11:22:44	AM	PID11	FLOW
8	3/14	11:22:27	AM	IMP-1	IMPO

GR0004

Ready

Start | System View (... | Generation M... | Picot | Test Function... | Microsoft Pow... | 2 BKHPanel | 11:45 AM

YOKOGAWA

Operation Menu Icon

OPERATION MENU

- Left
- Upper
- Right
- Previous History
- Next History
- NAME Name Input

OPERATION MENU KEY is to call Left window, Right Window, Upper Window, Recall windows backwards and Recall windows forward

NAME input window can also be called from this window.

3/14/2007 11:46 AM

IMP-1   IMP   LO

GR0004

Ready

Start | System View (... | Generation M... | Picot | Test Function... | Microsoft Pow... | GR0004 | 11:46 AM

YOKOGAWA

Tool Box Icons

vigilance.
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9/30/2004 4:34 PM

DataBase Equalize Complete

TOOL BOX

Tool Box

PINNING A WINDOW

HELP WINDOW

ROTATE

PINNING A WINDOW icon is to pin the windows on the HIS. When a window is pinned, the window will be displayed on the HIS even if multiple windows are called. The window can be closed only by selecting the window close button.

HELP window displays system defined help messages as well as user defined help messages. User defined help messages are created in the engineering builder and they can be linked to individual windows. When a help message is linked to a window, the help message shall be displayed when you call the window and select the HELP key.

ROTATE will rotate the windows if multiple windows are viewed simultaneously.

YOKOGAWA ◆

Large Size

vigilance.
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3/14/2007 10:38 AM

COPY

Tool Box

CG0005 IMPORTANCE LEVEL

| IMP-1 IMPORTANCE 1 | IMP-2 IMPORTANCE 2 | IMP-3 IMPORTANCE 3 |

CG0005 IMPORTANCE LEVEL

Large Size

| IMP-2 IMPORTANCE 2 | IMP-3 IMPORTANCE 3 | IMP-4 IMPORTANCE 4 | IMP-5 IMPORTANCE 5 | IMP-6 IMPORTANCE 6 | IMP-7 IMPORTANCE 7 | IMP-8 IMPORTANCE 8 |

Call a middle size window on the screen.

Select the LARGE SIZE icon.

The same window will be displayed in large size.

Ready

Start | System Vi... | Generatio... | Picot | Test Funct... | Microsoft... | 6 BKHPanel | Navigator ... | 10:38 AM

YOKOGAWA ◆

Middle Size

Call a large size window on the screen.

Select the MIDDLE SIZE icon.

The same window will be displayed in medium size.

YOKOGAWA ◆

Left Window

YOKOGAWA ◆

Right Window

Upper Window

Related Builder Call

RELATED BUILDER CALL calls the engineering builder menu related to the window being displayed.

Related Control Drawing Builder Call

RELATED CONTROL DRAWING BUILDER CALL calls the control drawing builder menu related to the instrument being displayed.

Image File

IMAGE FILE

IMAGE FILE is a facility to store any window or windows in the HIS hard disk.

To enable this facility, the Output to File option needs to be selected in the HIS Set Up Menu.

Storing the Image

COPY

To store an image, call the windows to be stored.

Select COPY icon. The image will be stored in the hard disk.

Calling the Image

IMAGE FILE

To view the stored image, select IMAGE FILE icon on the Tool Box. The last stored image will be displayed on the HIS.
To view the images stored earlier select the OPEN FILE icon on the Image Window.
The stored images will be listed. Select the required image and select OPEN. The selected window will be displayed.

Training – A Helping Hand