

Safety Precautions

- **READ INSTRUCTIONS** - Read all safety and operating instructions before operating this product.
- **RETAIN INSTRUCTIONS** - Retain the safety and operating instructions for future reference.
- **CLEANING** - Unplug all equipment before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
- **ATTACHMENTS** - Use only attachments recommended by the manufacturer. Non-recommended attachments may result in the risk of fire, electric shock, or injury.
- **WATER and MOISTURE** - Keep all equipment away from liquids or any other type of moisture.
- **ACCESSORIES** - Do not place this equipment on an unstable cart, stand or table. The equipment may fall causing serious injury to a child or adult, and serious damage to the equipment. Wall or shelf mounting should follow the manufacturer's instruction, and should use a mounting kit approved by the manufacturer.
- **POWER SOURCE** - The camera should only be operated from the type of power source indicated in this Instruction Manual.
- **POWER CORDS** - Do not allow anything to rest on the power cord. Do not locate this product where the cord will be abused by persons walking on it.
- **LIGHTNING** - When this product is left unattended or unused for long periods of time, unplug it from the power supply and disconnect it from other equipment. This will prevent damage to the video product due to lightning and power-line surges.
- **OVERLOADING** - Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
- **FOREIGN OBJECTS** - Never insert objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock.
- **SERVICING** - Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
- **DAMAGE REQUIRING SERVICE** - Disconnect the wires from camera equipment and refer servicing to qualified service personnel under the following conditions:
 - a) When the power-supply cord or the plug has been damaged.
 - b) If the video product has been exposed to moisture.
 - c) The video product does not operate normally by following the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
 - d) If the video product has been dropped, or the cabinet damaged. When the video product exhibits a distinct change in performance - this indicates a need for service.

TABLE OF CONTENTS

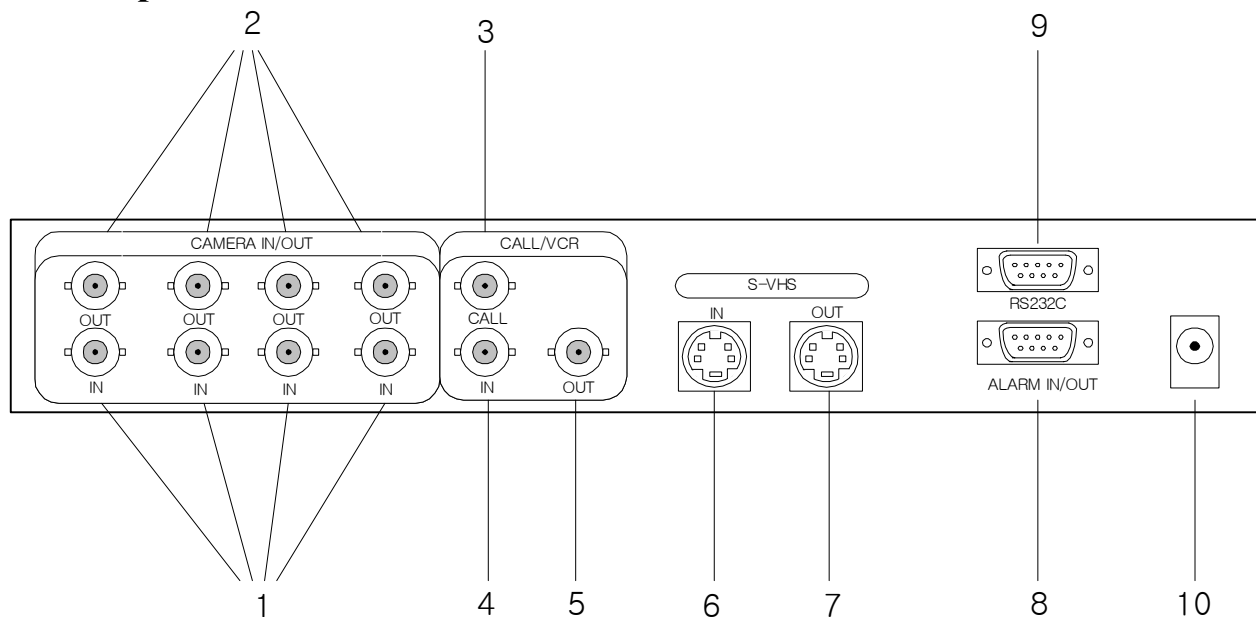
Safety Precautions.....	2
Features	4
Installation	5
System Configuration	6
Operation	7
Utilizing Loop Out	11
Setup Menu operation	12
Alarm	18
Remote Control	19
Specification	20

Features

- **High Resolution (720×512)**
- **QUAD Split or full screen display**
- **Automatic Gain Control(AGC)**
- **Picture-in-picture function (PIP)**
 1. ONE PICTURE-IN-PICTURE function
 2. TWO PICTURE-IN-PICTURE function
 3. Sequence PICTURE-IN-PICTURE function
 4. PICTURE-IN-PICTURE Location Setting function
- **Picture-out-picture function (POP)**
- **FREEZE on Quadrant screen and FULL FREEZE function**
- **2xZOOM function**
 1. Zoom for each quadrant screen
 2. Location SETTING ZOOM
- **Camera Title display on screen**
- **Time/Date display on screen**
- **Alarm Sound and message on screen**
- **Video loss detection and display on screen**
- **Loop-Thru output for each camera input**
- **Independent channel dwell time setting**
(Rolling Free Frame Switching function)
- **Alarm Input and Output**
- **Internal Alarm Buzzer**
- **RS232C communication**

Installation

Rear panel



1. CAMERA INPUT

- These BNC connectors accept the composite video output signal of color camera. Camera input termination is automatic (75 Ohm or Hi-Z).

2. LOOP-THRU

- These BNC connectors provide looping camera video from the corresponding camera input. Because of built in buffering amplifier to sense the connection of external BNC cables, input impedance of CAMERA IN input is automatically selected 75 Ohm or Hi-Z.

3. CALL OUTPUT

- This BNC connector provides a composite video signal to the main monitor for the display of selected camera in full screen or four cameras in QUAD split format.

4. VCR IN

- This BNC connector accepts the composite video playback signal from a standard VCR.

5. VCR OUT

- This BNC connector provide a composite video signal to record input of a standard VCR.

6. S-VHS IN

- This connector accepts the S-VHS playback signal from a S-VHS video recorder.

7. S-VHS OUT

- This connector provide a S-VHS video signal to record input of a S-VHS video recorder.

8. ALARM

- INPUT : The unit has 4 alarm inputs with one input assigned to each camera. The DB-9S connector allow alarm activation via contact closure or TTL/CMOS alarm input. Alarm input connections require two wires, one to the desired alarm input pin and the other to an available ground pin.
- OUTPUT : The unit has one Form "C" dry contact alarm output.

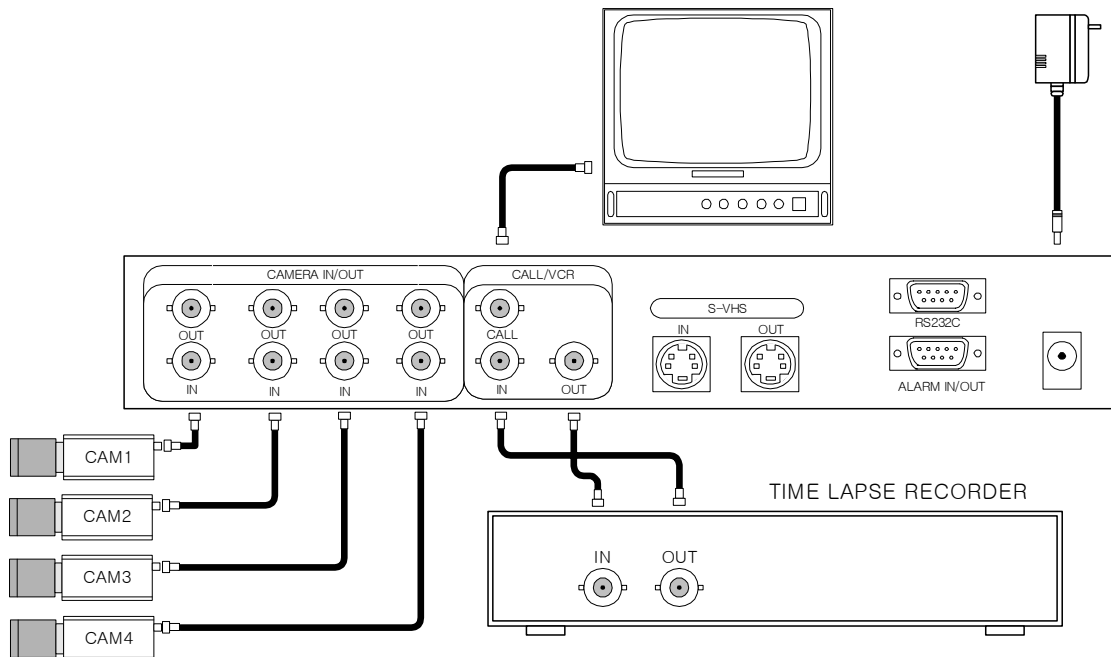
9. REMOTE

- This DB-9S connector allows remote control RS-232 data, or optional remote front panel.

10. POWER

- This 2.1mm pin jack accepts DC 12 Volt at 1.0 ampere. The center pin is positive.

System Configuration



Connection :

This unit accept maximum 4 camera input.

Connect color camera video output to CAMERA IN BNC input of the unit.

Loop out of the unit provide the same output of the camera input.

Impedance of the loop output is automatically set 75 Ohm or Hi-Z, and come thru internal buffering amplifier.

CAUTION:

Do not connect camera video output to loop output.

CALL OUT of the unit shall be connected to main monitor input.

This CALL out provide QUAD screen or individual camera image.

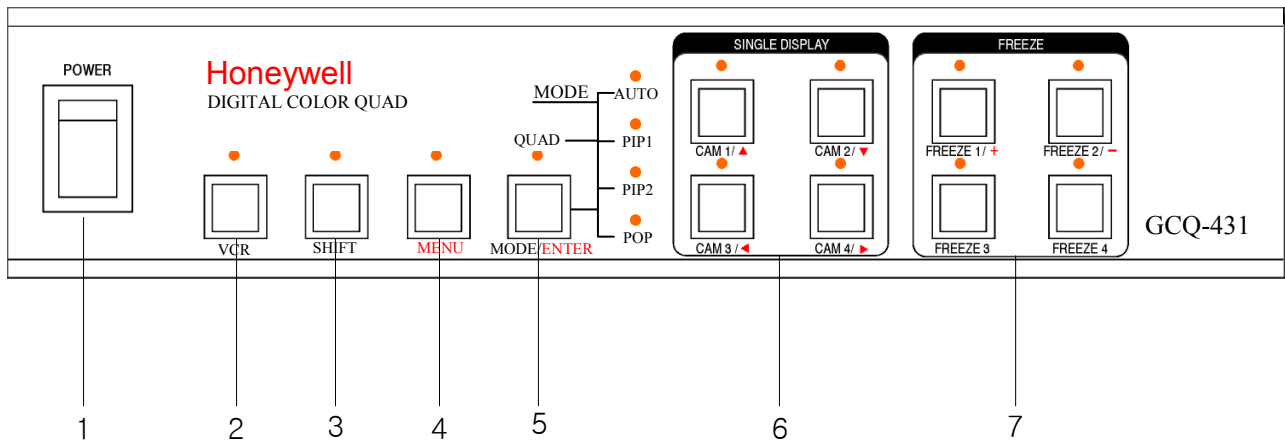
VCR IN BNC connector accepts the composite video playback signal from a standard VCR.

VCR OUT BNC connector provide a composite video signal to record input of a standard VCR.

This unit 2.1mm pin jack accepts DC 12 Volt at 1.0 ampere. The center pin is positive.

OPERATION

FRONT PANEL



1. POWER

This switch control main power ON/OFF.

2. VCR Playback Button

Select VCR playback screen.

3. SHIFT button

Select zoom screen
In PIP or POP mode, select function.

4. MENU

This button enters the setup mode when pressed. Pressing again exits the setup mode.

5. MODE/ENTER button

Select a Quadrant screen
In MENU mode, Enter button
Select Auto Switching mode
Select PIP or POP mode
In VCR playback mode, select ZOOM screen

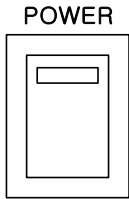
6. Full screen button

Select a single Full screen.
In menu, moves cursor
In PIP or POP mode, select Auto switching mode screen
In Zoom, select area to zoom
In VCR playback, zoom each quadrant

7. FREEZE

Freezes the selected screen display until the button is pressed a second time.
This key functions as data change key in menu mode..

POWER ON/OFF



Power ON:

Power light will be on when power is applied.

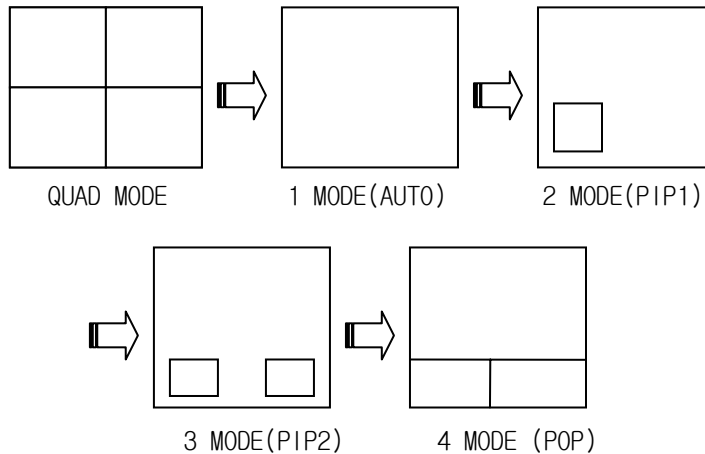
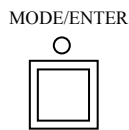
Power OFF:

Power light will be off when power is disconnected.

Caution:

Make sure to set the power switch OFF when the adapter main line source is applied.

Mode Select



QUAD MODE – Display quadrant screen

1Mode – Switch to Auto switching mode.

2Mode – PIP1 MODE

3Mode – PIP2 MODE

4Mode – POP MODE

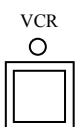
Caution:

Cycle these mode by pressing MODE/ENTER button

In VCR mode, select a ZOOM screen

In MENU mode, 'ENTER' button

VCR Playback mode select



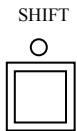
To select VCR playback mode, press VCR button.

Then image from VCR's video out will be displayed on monitor.

To release VCR playback mode, press VCR button in VCR playback mode.

Caution: To zoom each screen, press CAM1~CAM4 button.

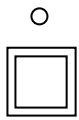
SHIFT Mode select



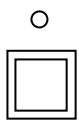
When you see a display to extend, choose mode button with Shift BUTTON.

And you can use extra function in the Shift mode OF PIP/POP mode.

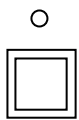
Full screen Select



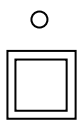
CAM1/◆



CAM2/▼



CAM3/◀



CAM4/▶

CAM1/◆

CAM1 Single Display.

CAM2/▼

CAM2 Single Display

CAM3/◀

CAM3 Single Display

CAM4/▶

CAM4 Single Display

Ex)

If you press 'CAM2' button, image from 2nd Camera will be displayed on monitor.

Caution: In VCR mode, these buttons will function as ZOOM button.

When in MENU mode, these keys are used for change data.

In PIP or POP mode, reference below.

PIP1 Mode:

CAM1/◆

Select Background

CAM2/▼

Each time you press this button, switch small and big screen.

1 - PUSH : Background AUTO Switcher

2 - PUSH : Small screen AUTO Switcher

CAM3/◀

Select small screen

PIP2 Mode:

CAM1/◆

Select background

CAM3/◀

Select small screen

CAM4/▶

Select small screen

POP Mode:

CAM1/◆

Select screen

CAM2/▼

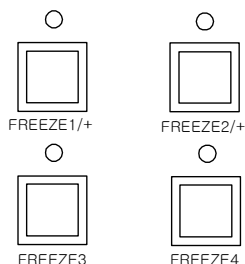
Switch to AUTO SWITCHING mode

Caution: In PIP/POP mode, press these buttons with SHIFT button to Select screen.

In VCR mode, use these buttons while pressing SHIFT button to select a area to zoom

FREEZE mode select

To select a FREEZE screen, just press FREEZE button.
In FULL screen mode, press ANY FREEZE button to freeze current screen.

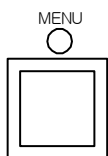


Use selection button to choose a FREEZE image.
At this time, Freezed camera's number will be flashed(Upper-left of monitor).
You can use these buttons in PIP or POP mode.

Ex:
If you press 'FREEZE2', image from camera 2 will be Freezed.

Caution:
If there's no input, FREEZE will not work.
In MENU mode, use these buttons to change parameters.

SETUP MENU



To select SET UP mode :

Except VCR mode, this button enters the setup mode whenever pressed.
Pressing again exits the setup mode.

In menu mode, press menu button to quit menu mode.

Caution:
When in MENU mode, alarm will be disable.

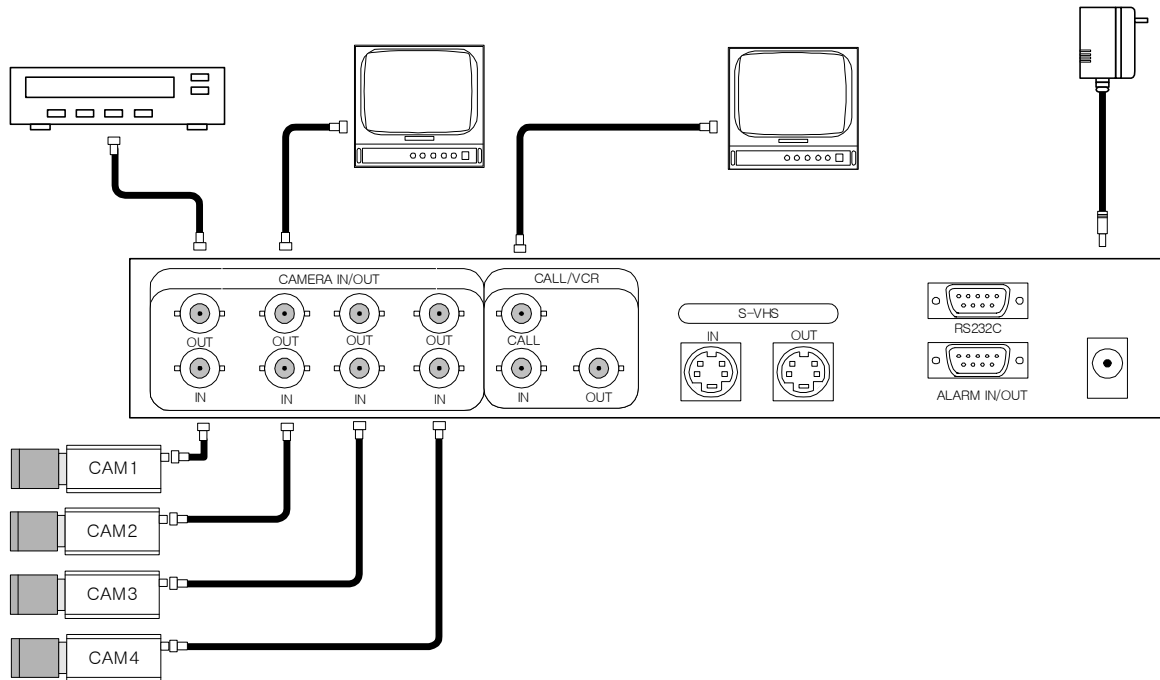
UTILIZING LOOP OUT

Utilizing Loop Thru output

This unit provide loop out BNC connectors for each camera input. Each output is automatically terminated between 75 Ohm and Hi-z to enable connection to slave monitor or Time LAPSE VCR.

Loop out of the unit is buffered by internal 1:1 amplifier. Loop out should not be connected to a camera output.

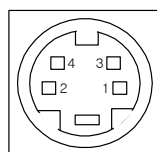
Follow is typical example of the loop out wiring diagram.



S-VHS VCR connection

This unit provide S-VHS VCR IN & OUT connector. This connector accepts the S-VHS playback signal and provide S-VHS video from and to a S-VHS video recorder. S-VHS output video does not contain time/date or message.

Following is pin layout of S-VHS connector.



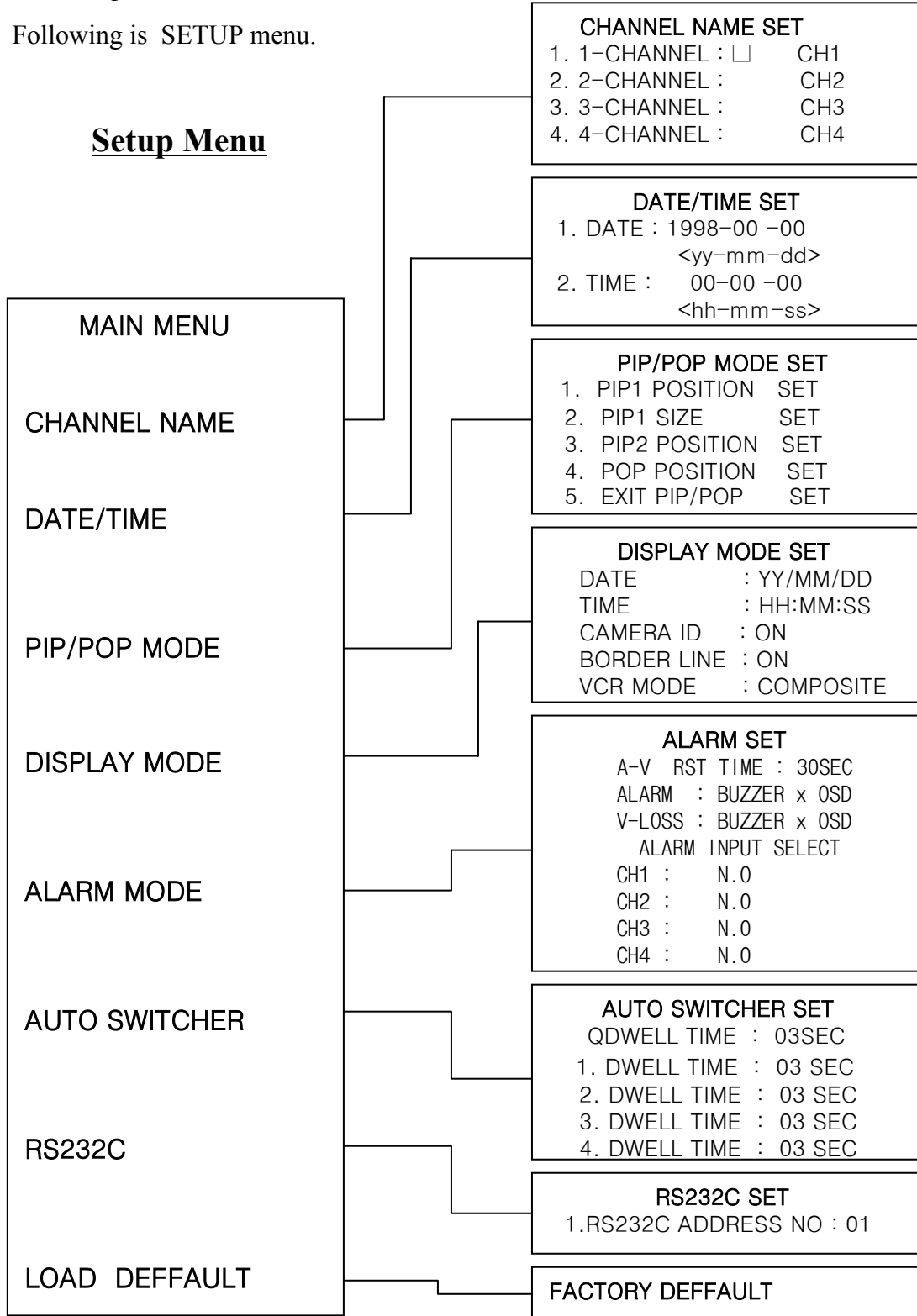
- 1) GND
- 2) GND
- 3) Y-Signal
- 4) C-Signal

SETUP MENU Operation

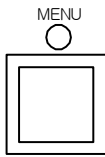
Up to date Digital based Video Technology enables outstanding video quality and user friendly menu driven setup for easy operation for beginner.

This unit provide SETUP menu ON-SCREEN and user can set the menu with buttons on front panel.

Following is SETUP menu.



USER SETUP MENU



To enter SETUP mode;

Except VCR mode, SETUP menu will be displayed on screen by pressing MENU button.

To exit SETUP ;

Pressing again exits the setup mode.

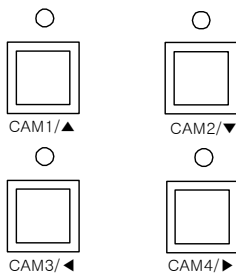
Caution:

When in SETUP mode, alarm will be disable.

When you change data, if you press MENU button without pressing ENTER button, data will not be saved as changed.

USE of CURSOR BUTTON

Four buttons on the right side are for CURSOR movement and these keys are used for selecting MENU.



▲ Button: This button moves CURSOR UP.

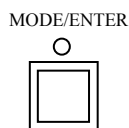
▼ Button: This button moves CURSOR DOWN.

◀ Button: This button moves CURSOR LEFT.

▶ Button: This button moves CURSOR RIGHT.

ENTER Button : This button is used to confirm and save changed data.

When this button pressed while a menu is selected, value or setting which is located by cursor will be saved.



Caution:

Press MENU button If you do not want to save modified data.

MAIN MENU

MAIN MENU	
1. CHANNEL NAME	SET
2. DATE/ TIME	SET
3. PIP/POP MODE	SET
4. DISPLAY MODE	SET
5. ALARM MODE	SET
6. AUTOSWITCHER	SET
7. RS232C ADDRESS	SET
8. LOAD DEFFAULT	VALUE

The main MENU provides access to all programming facilities. In the menu mode, changes can be made using the programming and select buttons according to the prompts that appear at the bottom of the menu number.

To select menu ;

- (1) Move the cursor using ▲, ▼ button
- (2) press **ENTER** button
- (3) lower level menu will be displayed on screen

Pressing MENU button again exits the main setup mode.

Caution:

LOAD DEFAULT VALUE does not contain lower level menu.

CAMERA TITLE

CHANNEL NAME SET	
1. 1-CHANNEL: <input type="checkbox"/>	CH1
2. 2-CHANNEL: <input type="checkbox"/>	CH2
3. 3-CHANNEL: <input type="checkbox"/>	CH3
4. 4-CHANNEL: <input type="checkbox"/>	CH4

Numbers 1-4 on the camera title setup screen are used to set each camera title. A 8-character title can be designated for each camera, and this title appears on screen when the display option is ON and camera is selected.

The default camera title is the corresponding channel number.

To modify camera ID;

- (1) Select *CHANNEL NAME SET* from the main menu.
- (2) Press **ENTER** button.
- (3) Select camera number using ▲, ▼ button.
- (4) Select desired character position using ◀, ▶ button.
- (5) Change character using +, - button.
- (6) Press **ENTER** button to save changed title.

means the location to change data.

When you keep on Putting +, - button, Letters Changes Rapidly

TIME and DATE Setup

DATE/TIME	
1. DATE : 2000-00-00	<yy-mm-ss>
2. TIME : 00-00-00	<hh-mm-ss>

This menu allows you to set present time and date on the screen

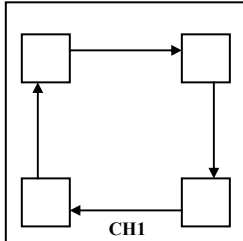
- (1) Select *DATE/TIME* from the main menu.
- (2) Press **ENTER** button.
- (3) Press ▲, ▼ button to select date or time.
- (3) Press ◀, ▶ button to select desired data to change.
- (4) Press +, - button to change data.
- (5) Press **ENTER** button to save data.

PIP/POP MODE Setting

PIP/POP MODE SET	
1.PIP1 POSITION	SET
2.PIP1 SIZE	SET
3.PIP2 POSITION	SET
4.POP POSITION	SET
5.EXIT PIP/POP	SET

To set PIP/POP MODE:

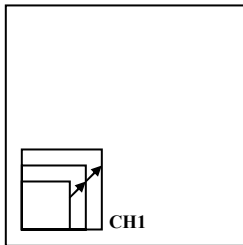
- (1) Select PIP/POP MODE SET from MAIN MENU.
- (2) Press ENTER.
- (3) New Submenu, PIP/POP MODE SET will be displayed.
Details are below.



1. PIP1 POSITION SET

To change small screen's location in PIP1:

- (1) Select PIP1 POSITION SET from PIP/POP MODE SET.
- (2) Press ENTER.
- (3) Change location with +, - button.
- (4) Press ENTER to finish.

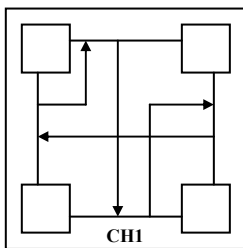


2. PIP1 SIZE SET

To change small screen's size in PIP1:

- (1) Select PIP1 SIZE SET from PIP/POP MODE SET.
- (2) Press ENTER.
- (3) Change the size with +, - button.
- (4) Press ENTER to finish.

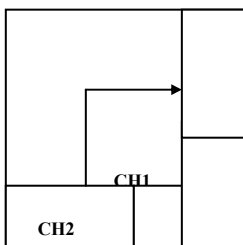
Caution: There are 3 steps of size.



3. PIP2 POSITION SET

To change 2 small screen's location in PIP2:

- (1) Select PIP2 POSITION SET from PIP/POP MODE SET
- (2) Press ENTER.
- (3) Change location with +, - button.
- (4) Press ENTER to finish.



4. POP POSITION SET

To change the location of screen in POP:

- (1) Select POP POSITION SET from PIP/POP MODE SET
- (2) Press ENTER.
- (3) Change location with +, - button.
- (4) Press ENTER to finish.

5. EXIT PIP/POP SET

Exit from PIP/POP SET and return to MAIN MENU.

Caution: If you press ▲, ▼, ◀ or ▶ button, return to PIP/POP SET.

DISPLAY Option

DISPLAY MODE SET
DATE : YY/MM/DD
TIME : HH:MM:SS
CAMERA ID : ON
BORDER LINE : ON
VCR MODE : COMPOSITE

ALARM Setup

ALARM
A - V RST TIME:30SEC
ALARM : BUZZER x OSD
V-LOSS: BUZZER x OSD
ALARM INPUT SELECT
CH1 : N.O
CH2 : N.O
CH3 : N.O
CH4 : N.O

The display option allows you to select whether to display Title or Time/date on the screen. Also you can decide border line.

- (1) Select *DISPLAY MODE* from the main menu.
- (2) Press **ENTER** button.
- (3) Press **▲, ▼** button to select desired item to change.
- (4) Press **+, -** button to change display options.
- (5) Press **ENTER** button to save data.

Change DATE DISPLAY

YY/MM/DD Year/Month/Date
DD/MM/YY Date/Month/Year
MM/DD/YY Month/Date/Year
OFF

Change TIME DISPLAY

HH:MM:SS hour/Min/Sec
HH:MM Hour/Min
OFF

Change CAMERA ID DISPLAY

ON CAMERA ID DISPLAY ON
OFF CAMERA ID DISPLAY OFF

BORDER LINE

- ON** Border line will be displayed in QUAD mode.
OFF Border line will be disappeared in QUAD mode.

VCR MODE

COMPOSITE VCR INPUT COMPOSITE
S-VIDEO VCR INPUT S-VIDEO

This menu allows you to select alarm respond option and video loss alarm for each input channel.

To modify alarm respond option or video loss option ;

- (1) Select *ALARM MODE* from the main menu.
- (2) Press **ENTER** button.
- (3) Press **◀, ▶** button to select desired data to change.
- (4) Press **+, -** button to change data.
- (5) Press **ENTER** button to save data.

ALARM SETUP Option

RESET(hold) TIME

This option is used to set the amount of time that the alarm relay and alarm record display continues after the alarm has triggered. Valid settings are from 0 to 99 seconds. The default setting is 30 seconds.

Caution:

When RESET TIME is set 0 second, alarm can be terminated only by Press key.

OFF The alarm input is ignored.

OSD "ALARM" message will be displayed on alarm.

BUZZERxOSD Both buzzer and alarm message will be activated on alarm.

ALARM INPUT SELECT

N.O Normal Open
N.C Normal Close

DWELL TIME

AUTO SWITCHER SET
QDWELL TIME : 03SEC
1. DWELL TIME : 03SEC
2. DWELL TIME : 03SEC
3. DWELL TIME : 03SEC
4. DWELL TIME : 03SEC

The dwell time setting is used for the sequential switching mode for each camera. Valid dwell times are from 1 to 99 seconds.

Cameras that have a dwell time set to 0 seconds will be excluded from the switching sequence even if they are connected to the system.

Cameras with dwell times from 1 to 99 seconds will be displayed.

To set DWELL TIME ;

- (1) *Select AUTO SWITCHER SET from the main menu.*
- (2) Press **ENTER** button.
- (3) Press **▲, ▼** button to select desired item to change.
- (4) Press **+, -** button to change individual dwell time.
- (5) Press **ENTER** button to save data.

AUTO SWITCHER DWELL TIME SETUP

Time Setting : 1 to 99

RS232C ADDRESS SETUP

This unit provides remote control for RS-232 data.

This option is used to assign the unit number by address setting via RS-232C remote command.

- (1) *Select RS232C ADDRESS SET from the main menu.*
- (2) Press **ENTER** button.
- (3) Press **+, -** button to change address options.
- (4) Press **ENTER** button to save data.

FACTORY DEFAULT

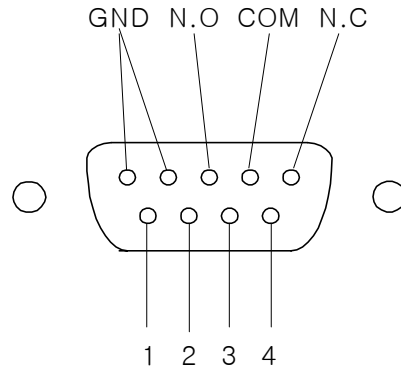
This option allows you to return to the unit to all factory defined defaults.

Warning : *This action erases all user settings and cannot be undone. Use the following steps to reset the unit to factory defaults.*

- (1) *Select LOAD FACTORY VALUE from the main menu.*
- (2) Press **ENTER**, default value will be loaded.

ALARM

This unit is using DB-9S connector to allow alarm Alarm INPUT and OUTPUT.



D-SUB 9 pin description

1,2,3,4 INPUT : The 4 alarm inputs are assigned to each camera.

GND This is to connect ground wire of the sensors.

N.O This is Normal Open alarm output for normal VCR or TIME LAPSE VCR.

N.C This is Normal Close alarm output for normal VCR or TIME LAPSE VCR.

COM This is COMMON alarm output.

Alarm mode

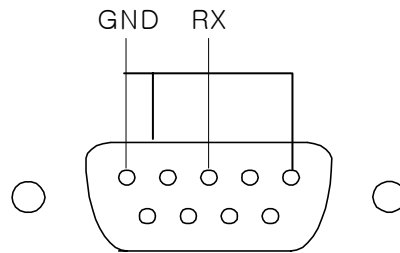
When an alarm occurs in the live mode, the assigned camera will be displayed in full screen. More than two alarms occur at the same time, full screen will be changed to QUAD mode. This alarm screen will be remain until programmed alarm hold time which was set in menu.

Press Key button clear alarm mode regardless of alarm reset time.

Alarm reset(hold) time in multi-alarm will remain from the latest alarm.

Remote Control

This unit provide RS232C port for remote control and up to 15 units can be controlled by RS-232C..



Methods : RS232C

Communication : Asynchronous

Data rate : 9600BPS

Protocol : 1 Start bit , 8-bit Data, No parity, 1 Stop bit.

Communication Protocol

Start + Command + End command
1FH + Command Code+ 2FH

Command set

MSB 4 bit : ADDRESS Bit ; 1XH ~ FXH
LSB 4 bit : CONTROL CODE ; X1H ~ XCH

Control code	Function	Control Code	Function
X1H	VCR	X7H	FREEZE3
X2H	SHIFT	X8H	FREEZE4
X3H	MENU	X9H	CAM1/▲
X4H	MODE/ENTER	XAH	CAM2/▼
X5H	CAM3/◀	XBH	FREEZE1/+
X6H	CAM4/▶	XCH	FREEZE2/-

X stands for address of the unit and this code can be set in menu.

Valid X data is from 1 to F.

1: Address 1	2 : Address 2	3 : Address 3	4 : Address 4
5: Address 5	6 : Address 6	7 : Address 7	8 : Address 8
9: Address 9	A : Address 10	B : Address 11	C : Address 12
D: Address 13	E : Address 14	F : Address 15	

Example)

1FH + **19H** + 2FH ; Select CAM 1 of the address #1 QUAD unit.

Caution:

The RS232 remote pin of the GCQ-431 is an input only.

Each command requires 100msec delay time.

ADDRESS means assigned unit number.

SPECIFICATION

Video format

NTSC (525LINES,60FIELDS/SEC),
PAL(626LINES,50FIELD/SEC)

Camera Input

Composite, 1.0V p-p, 75Ω

Video Output

Composite, 1.0V p-p, 75Ω

Video Compression (QUAD)

Horizontal 2:1
Vertical 2:1

Display Rate (Full screen)

Real time, 60FIELDS/SEC

Display Rate (QUAD)

Real time, 60FIELDS/SEC

Camera Title

8 character, Alphanumeric

Dwell Time

1 ~ 99 Sec. programmable

REAL TIME CLOCK

CMOS battery back up module

Time and date display on screen

Display format :

DATE : YY/MM/DD, OFF

TIME : HH:MM:SS, OFF

ALARM

(1) Input : Normal open

(2) Output : NO/COM/NC

24V/1.0A, 115V/0.5A

(3) Alarm RST time : 0 ~ 99 sec.

Alarm sound and message

Power

DC 12 Volt

Ambient conditions

Operating : 0 ~ 40°C

Storage : -20 ~ 70°C

Dimensions

215(W) × 280(D) × 44(H)

Weight

3 Kgs