Integrated High Speed Dome Camera

User's Manual

Indoor / Outdoor

Ver 1.2

<u>Table of Contents</u>

1. Overview

The Dome Camera delivers up to 432x zoom ratio (A3 Model) to capture clear image in the distance. Continuous Auto Focus, Back Light Compensation, Auto Exposure and Digital Slow Shutter functions are provided for clear and high quality image. Removable IR cut filter ensures 24 hours operation, while Privacy Masks are specially designed to avoid any intrusive monitoring at specific region; all of the salient functions can be incorporated to meet your needs. The Home function allows users to specify a preset position as the <home position> or <home functions> (Sequence / Auto-pan / Cruise). Under the mode, Dome Cameras can come back to the preset home position or functions when the camera has been idle for a user-defined period of time. Additionally, the unique Schedule function enables users to program a preset point or function (Sequence / Auto-pan / Cruise) so that these actions can be automatically performed in certain period of time.

The Dome Camera provides variable pan / tilt speeds ranging from a fast patrol of 400° per second to a slow ramble of 5° per second with 0.225° pan / tilt accuracy for fast and accurate tracking ability. The 360° endless rotation and -10°~190° tilt travel make tracking the object passing directly beneath the dome. Maximum 256 preset points can be programmed for precise location of target areas, and users can also define Sequence lines, Auto-Pan lines and Cruise routes for the camera to operate automatically. In addition, RS-485 communication port is available for remote control purposes.

The Integrated High Speed Dome Camera provides 4 alarm inputs and 2 alarm relay outputs, and the smart alarm management mechanism can be programmed through the OSD setup menu; certain function (Preset / Sequence / Auto-Pan / Cruise) can be activated when an alarm is triggered.

Large set of built-in protocols provide connectivity to other surveillance systems. The built-in protocols include DSCP, Pelco, VCL, Philips, AD-422, etc, which allow the Dome Camera series to be integrated with other suppliers' surveillance systems.

1.1   Features

Precise and Accurate Performance

- Auto Calibration
- Preset accuracy of 0.225°
- Preset speed up to 400° /sec.
- Proportional Pan & Tilt Speed
- Preset Position / Sequence / Auto-Pan / Cruise

Dynamic Applications

- Multi-language OSD
- Schedule function
- Multiple built-in Protocols
- Up to 20 masking zones
- 4 alarm inputs, 2 alarm output
- Motion Detection
- Flexible mountings
- Compact lightweight design for easy installation
- All-in-one type

Superior Camera Image Quality

- Minimum illumination 0.01 Lux (B / W)
- Digital Slow Shutter
- Electronic Shutter
- Wide Dynamic Range
- Auto White Balance
- Backlight Compensation
- Auto Exposure
- Image Inverse
- Removable IR Cut Filter
- Digital Noise Reduction
- Electronic Image Stabilizer

1.2   Package Contents

Please check the box contains the items listed here. If any item is missing or has defects, DO NOT install or operate the product and contact your dealer for assistance.

Indoor Dome Camera Package

Camera Body

Optical Cover

Hard Ceiling Mount

M4 Screw (x4)

Plastic Anchors (x4)

Quick Guide

CD: Operation Manuals
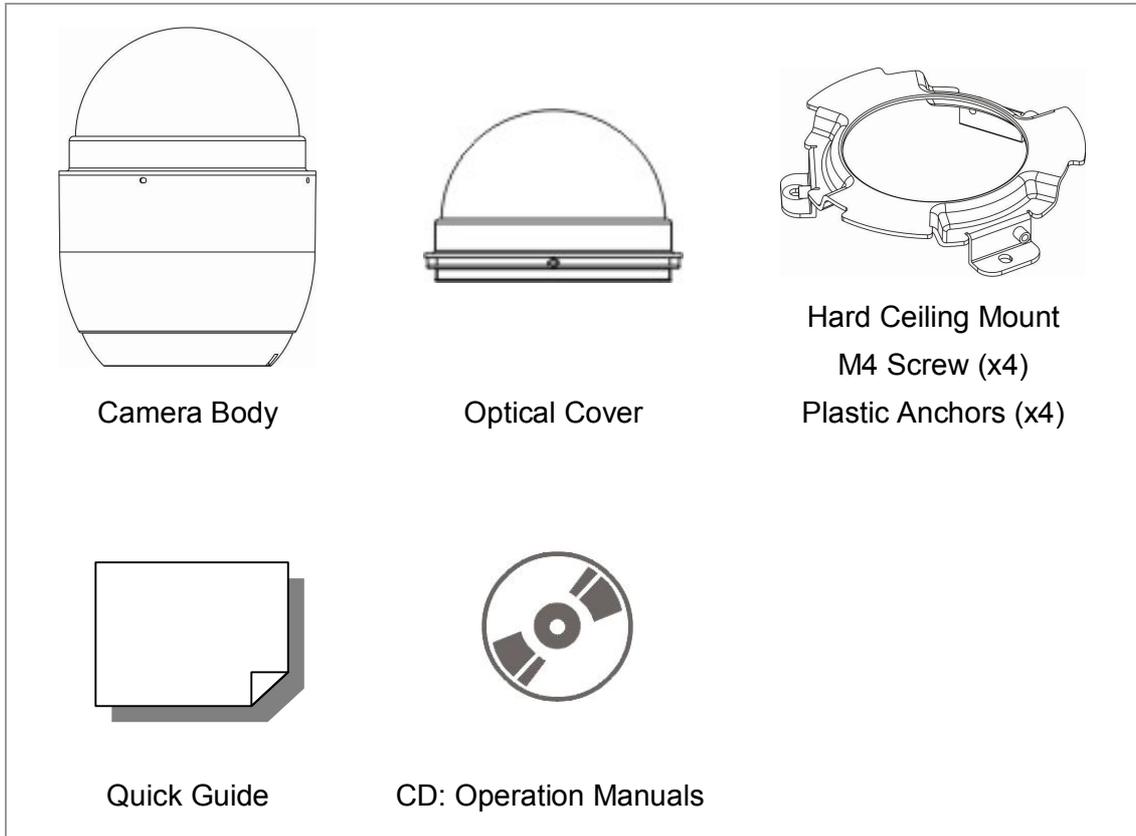
Outdoor Dome Camera Package
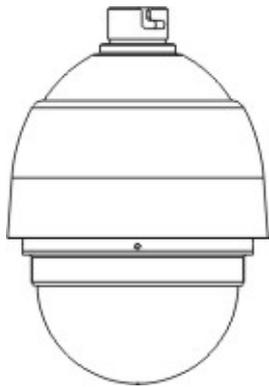
Dome Camera with
Outdoor Mount Kit

M3 Standard Screw (x1)
M3 Security Screw (x1)*
M5 Standard Screw (x1)
M5 Security Screw (x1)*
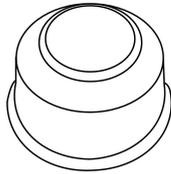
Waterproof Rubber
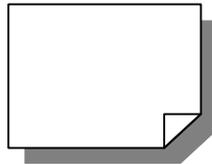
Quick Guide

CD: Operation Manuals
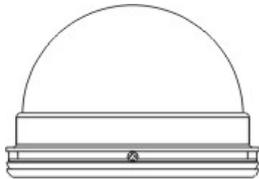
Optical Cover
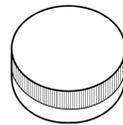
Lubricant

Security Torx*

*Optional: For Vandal Proof Cover only.

1.3   Dimension

Indoor

R125

90.6°   228.71

96.91

R74.86

R85.85

Unit:mm

Outdoor

102   282.11

191.97
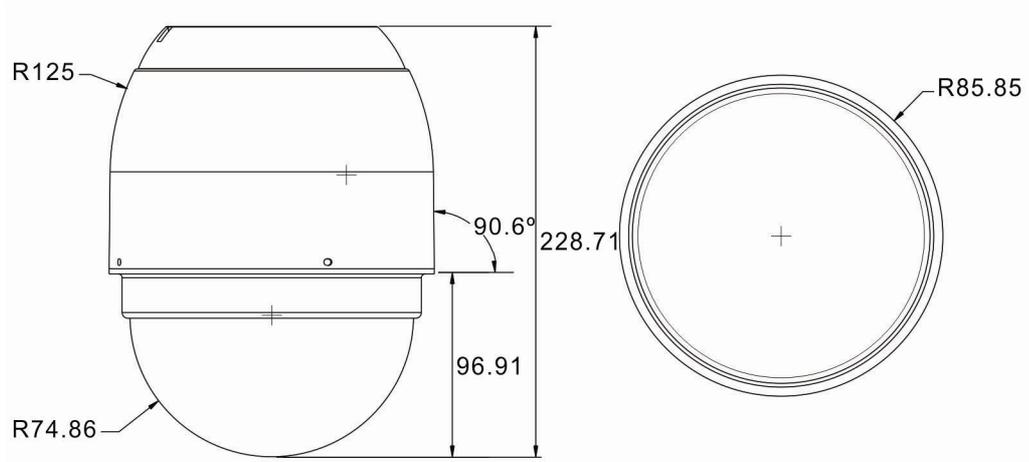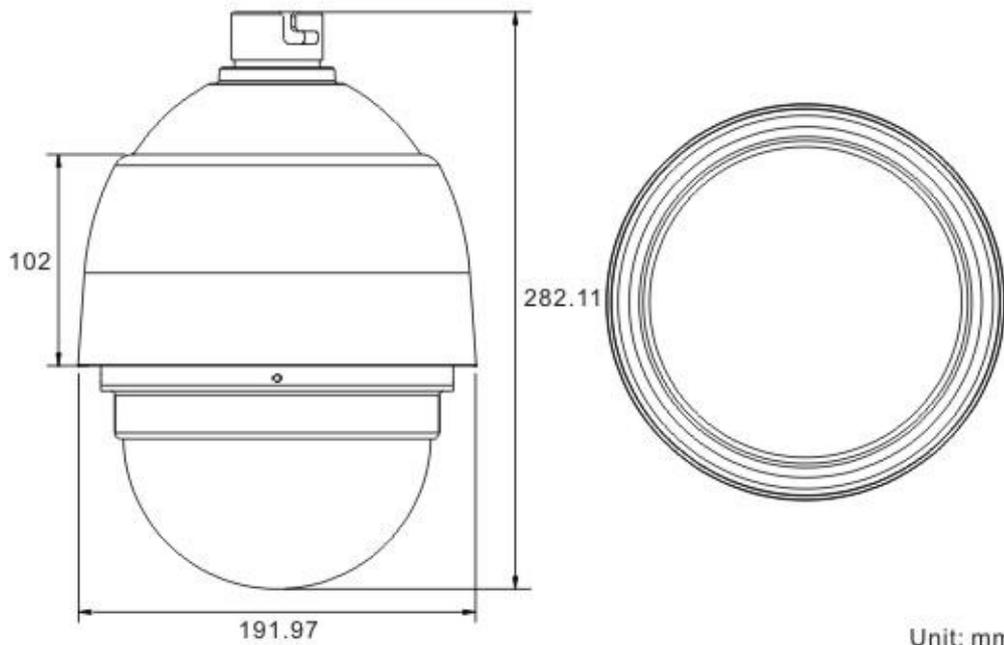
Unit: mm

2.   Camera Cabling

Please follow the instructions below to complete SDI High Speed Dome Camera cable connections.

2.1   Product Application

Connect the Dome Camera to other devices as shown in the diagram to complete a video surveillance solution.
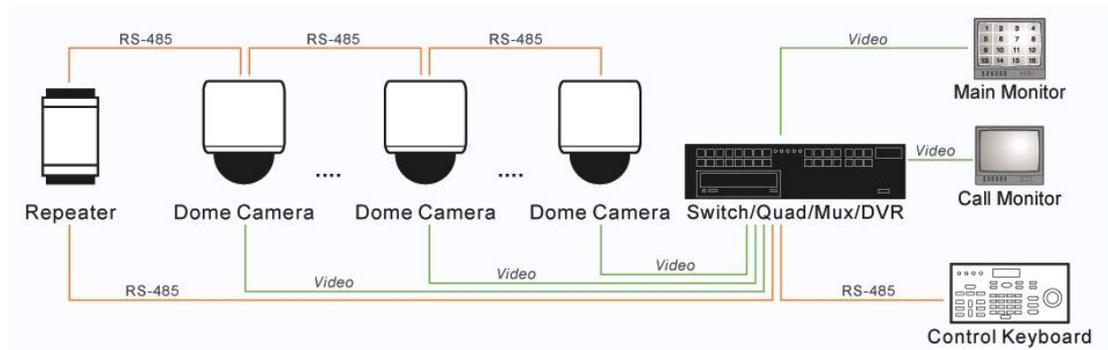
⚠️ **NOTE:** To extend the network distance up to 1.2 km (4000 feet) and to protect the connected devices, it is highly recommended to place a repeater at the mid-point. However, a repeater may be needed in the network distance less than 1.2 km if the used cables are not the CAT 5, 24-gauge cables; refer to 2.7 RS-485 Connector Definition. Refer to the repeater's manual for detailed information.

2.2   Switch / Connector Definition

Configuring the Dome Camera's ID and communication protocol are required before connecting the Dome Camera to other devices. The switches used for configuring these settings are located on the camera's back plate. Additionally, the 22-Pin Connector for Data Cable connection and ISP Connector for firmware upgrade kit connection are also set on the back plate.

Please refer to the diagram and table accompanied with for use of each switch / connector.

Indoor   **Outdoor**
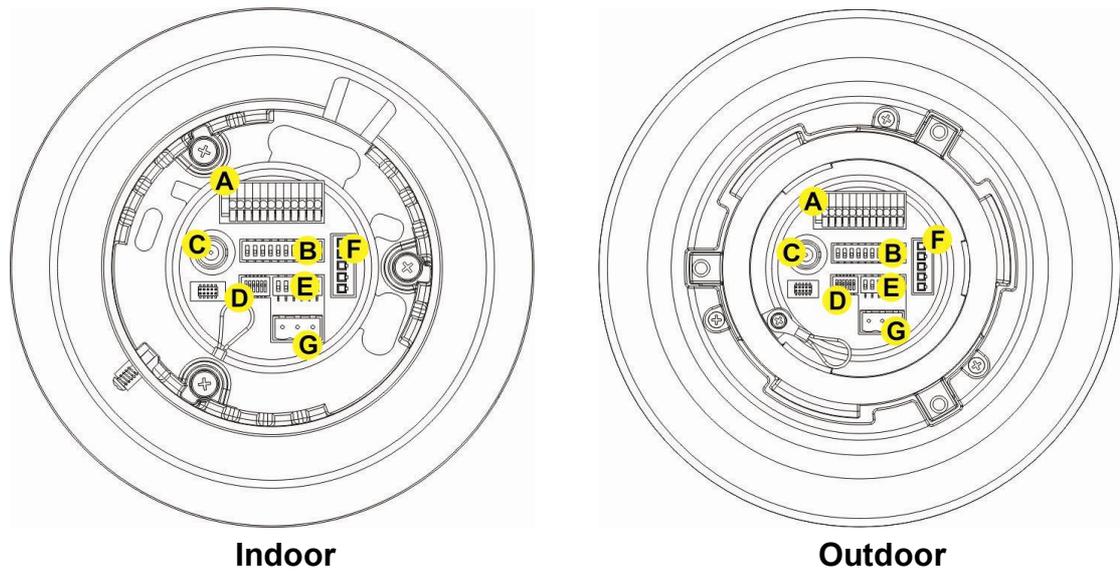
Item	Definition	Remark
A	I/O	ALARM I/O
B	ID	Dome Camera ID Setup DIP Switch
C	BNC	BNC Video Output
D	SETTING	Communication Switch Setting
E	Protocol	Camera Control Protocol Setting
F	RS485	RS485 Connector
G	AC24V Connector	Power connector

2.3   Communication Switch Setting

The Camera's communication switches are specified in the table below.

Communication Switch	SW 1	
	SW 2	RS-485 Setting
	SW 3	
	SW 4	
	SW 5	Reserved
	SW 6	Reserved
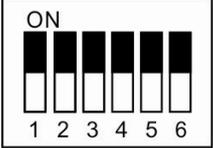
RS-485 is the interface that communicates the Camera and its control device; for this reason, the RS-485 setup of the Camera and the control device must be the same. The RS-485 default setting is half-duplex (see the diagram follows). Please do not change the default setting without qualified specialist or supplier's notice.

RS-485 Setting	
Half-duplex	**Full-duplex**
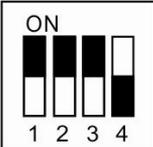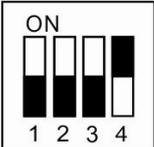
2.4   ID Setting

Please assign an ID number to a Camera if there is more than one Camera in the same network. The camera's ID can be setup using the 10-bit ID Dip Switch, which is located on the Camera's back plate. If the Camera's ID number is 6, for instance, the ID switch SW 2 and SW 3 should be set to "ON" and the rest should be set to "OFF" as shown below. Dip Switch configuration for ID No. 0~10 are listed in the table below. To complete ID setups, please refer to the User Manual.

For switch configuration details, please refer to Appendix B: Switch Settings Index Table.

NOTE: No two Cameras should be given the same ID, or communication conflict may occur.

2.5 Camera Control Protocol Setting

Define the protocol you are going to use basing on the devices of your surveillance system. Generally, use one protocol even the devices are provided from different manufacturers. Please refer to the table below for all supported protocols with their matching switch numbers and baud rate and choose a protocol for your Camera.

The table below shows various protocols with their matching switch numbers and baud rate.

Switch No.	Protocol	Baud Rate
00	VCL	9600
01	Pelco D	2400
02	Pelco P	4800
04	Chiper	9600
05	Philips	9600
07	DSCP	9600
08	AD422	4800
09	DM P	9600
11	Pelco D	4800
12	Pelco D	9600
13	Pelco P	2400
14	Pelco P	9600
15	JVC	9600
21	Kalatel-485	9600
22	Kalatel-422	4800

Use the 6-bit dip switch (Camera Control Protocol Switch) to set your camera's control protocol and its baud rate. If select protocol "Pelco D", which is of switch no. 01 and baud rate 2400, for instance, set the SW-1 to "ON," with the rest to "OFF" as shown below.
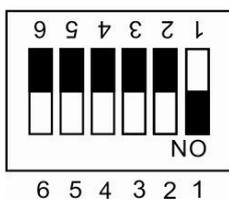
For switch configuration details, please refer to Appendix B: Switch Settings Index Table.

2.6   Power Connector

Please refer to the illustrations below for power connector definition before wiring.
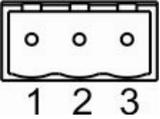
	SW 1	AC24V_1
	SW 2	GND
	SW 3	AC24V_2

2.7   Apply Alarm I/O

The Camera supports 4 digital alarm inputs and 2 digital alarm outputs. Please make sure the alarm connections are properly wired before starting to configure alarm related settings. Please refer to the pin definition table below for alarm system wiring.
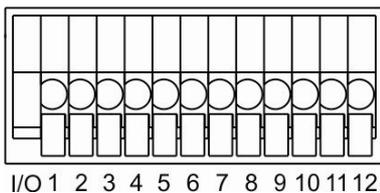
Pin	Definition	Pin	Definition
1	ALARM_OUT_NO_1	7	ALARM_OUT_COM_2
2	ALARM_OUT_NC_1	8	GND
3	ALARM_OUT_COM_1	9	ALARM_IN_4
4	GND	10	ALARM_IN_3
5	ALARM_OUT_NO_2	11	ALARM_IN_2
6	ALARM_OUT_CN_2	12	ALARM_IN_1

2.8   RS-485 Connector Definition

Please refer to the illustrations below for RS485 connector definition before wiring.

RS485 Connector	SW 1	R-
	SW 2	GND
	SW 3	R+
	SW 4	T-
	SW 5	T+

3.   Operation and Configuration

3.1   Display Format

The information shown on the screen is described in terms of OSD display, position and function description in the table below.
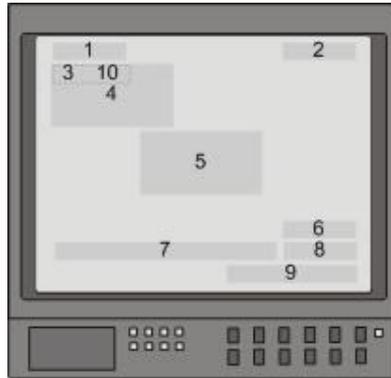
No.	Function	OSD Display	Description
1	Motion	MOTION	Alarm Detect Message
2	Alarm	ALARM 1	Alarm Message
3	Focus Modes & Backlight	A	Auto Focus Mode
		M	Manual Focus Mode
		X	Back Light Compensation OFF
		B	Back Light Compensation ON
4	Booting Message	XX…(Dome Type); ID: 001 (Default) DSCP / 9600 (Default) INITIALIZING	Shows Dome Type, ID Address, Protocol and Baud Rate
5	Error Message	PAN ERROR TILT ERROE CAM MODULE ERROR	Shows system initializing error message
6	Zoom Ratio	x1	Present Zoom Ratio (Optical Zoom/Digital Zoom)
7	Title	• Maximum 20 characters for each title. • 16 sets of title are available.	
8	Camera ID	001	Show the camera ID
9	Time	XXXX / XX / XX XX : XX	Year / Month / Day Hour: Minute
10	Position Display	XX YYY / YY	**XX:** facing direction of PTZ including N, E, Z, W, NE, SE, SW, SN **YYY / YY:** angle of PZT, 0~359 / 10~-90

3.2   Setup ID Display

Press the direction key down to turn the MAIN MENU page from 1 to 2, and then the menu item <ID DISPLAY> will be shown on the top. Users are allowed to choose whether the Camera's ID will be displayed on screen for identifying the domes. Display the ID address of the selected Camera on the right bottom of the screen by turning it <ON>. To hide the ID address of the selected dome, set the item <OFF>.

3.3   Setup Title Display

Users are allowed to name a view area, where the title will be displayed on screen for easy recognition.

Select <ON> to display the title set for a view area on screen while the camera shooting the view area.

When <TITLE DISPLAY> is set <OFF>, no title will be displayed on screen even titles have been set in advance.

3.4   Setup Title Name

Up to 16 zone titles can be set with maximum 20 characters for each title.

Follow the steps to set a camera title.

STEP 1:   Operate the Camera to a view area where you want to set a title for it.

STEP 2:   Turn on the OSD and go to the <MAIN PAGE 2> to select <TITLE SETTING>.

STEP 3:   Select a number to represent the view area.

STEP 4: Press the <CAMERA MENU> key (ENTER) on the keyboard to go into the editing page.

```
              TITLE SETTING: 01
0   1   2   3   4   5   6   7   8   9        EXIT
A   B   C   D   E   F   G   H   I   J        SAVE
K   L   M   N   O   P   Q   R   S   T        DELETE
U   V   W   X   Y   Z   :   /   .   ,


TITLE:
ABC
```
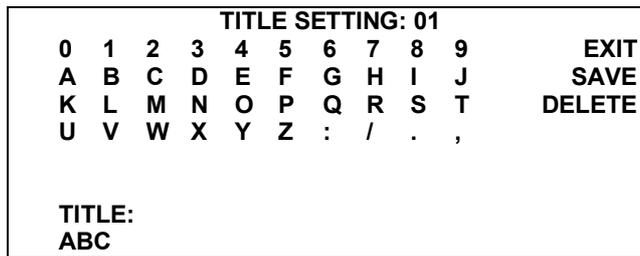
STEP 5: Choose a character with direction keys and then press the <CAMERA MENU> key (ENTER) to input. For example: <A> <CAMERA MENU>, <B> <CAMERA MENU>, <C> <CAMERA MENU>
TITLE: ABC

STEP 6: To delete input characters, move the cursor to <DELETE> and press <CAMERA MENU> to delete the selected character.

STEP 7: When the setting is completed, move the cursor to <SAVE> and press <CAMERA MENU> to save.

3.5   Setup Time

The time setting function is used to set the TIME related parameters of the integrated high speed dome. Each item in the menu is listed as follows.

- **TIME DISPLAY**
  Select <ON> to display time information on the screen or <OFF> not to display.

- **YEAR / MONTH / DAY**
  The items are for setting up the system date.

- **HOUR / MINUTE**
  The items are for setting up the system time.

3.6   Setup Schedule

The schedule function enables users to program a preset point or function (Sequence / Auto-pan / Cruise) automatically to perform in a specific period of time.

- **SWITCH**

  Select <ON> to enable or <OFF> to disable the schedule function.

- **POINT**

  Users are allowed to arrange 32 sets of schedule point, i.e. each set of schedule point can be assigned one kind of schedule modes.

- **HOUR / MINUTE**

  The items are for setting up the time to execute each schedule point.

- **MODE**

  This is for setting the schedule function of the selected schedule point; the options are including None, Preset, Sequence, Autopan, Cruise, IR Function, please refer to SDI High Speed Dome Camera OSD Menu for more details about the setup steps of each mode,.

- **SCHEDULE RESET**

  Users can reset the whole schedule with the item.

Appendix A: Technical Specification

	A2 Model	A3 Model
Camera		
Image Sensor	1 / 4" Sony CCD	
Optical Zoom	26x	36x
Digital Zoom	1 ~ 12x variable	
Effective Pixels	NTSC: 480k PAL: 570k	
Horizontal Resolution	650 TVL	
Scanning System	NTSC / PAL	
Synchronization	Internal / Line Lock	
Video Output	1.0 Vp - p / 75 Ω, BNC	
S / N Ratio	> 50 dB (AGC Off)	
Minimum Illumination	0.08 lux (Color), 0.005 lux (B / W)	
Focal Length	3.4 ~ 88.4 mm	3.4 ~ 122.4 mm
Focus Mode	Auto / Manual	
White Balance	Auto / Manual	
Iris Control	Auto / Manual	
Electronic Shutter	1 / 1 ~ 1 / 10k sec.	
AGC Control	Auto / Manual	
Backlight Compensation	On / Off	
Operation		
Pan Travel	360° endless	
Tilt Travel	- 10° ~ 190°	
Manual Speed	0.5° ~ 90° /s	
Presets	256	
Preset Accuracy	0.225°	
Preset Speed	5° ~ 400° /s	
Sequence	8	
Auto Pan	4	
Cruise	8	
Privacy Mask	20 (w / o motion detection window) 16 (w / motion detection window)	
Proportional Pan & Tilt	On / Off (Pan and tilt speed proportional to zoom ratio)	
Resume after Power loss	Yes	
Home Function	Preset / Sequence / Auto pan / Cruise	
Auto Flip	Image / Mechanical / Off	
Digital Slow Shutter	On / Off	
Motion Detection	On / Off	
Wide Dynamic Range	On / Off	
Day / Night: IR Cut Filter	On / Off	
Image Freeze	On / Off	
Image Inverse	On / Off	
Noise Reduction — 2D	On / Off	
Noise Reduction — 3D	On / Off	
Electronic Image Stabalizer	On / Off	
Multiple Languages	English / French / German / Italian / Japanese / Polish / Portuguese / Russian / Spanish / Turkish / S. Chinese / T. Chinese	
Built-in Protocol	DSCP / Pelco P / Pelco D / AD422 / Philips / Kalatel / VCL / JVC	
Zone Title	16	
Alarm — Input	4 sets / 5V 10kΩ pull up	
Alarm — Output	2 sets / Relay output, max. 2A DC 30V / 0.5A AC 125V	
Alarm Reaction	Preset / Sequence / Auto Pan / Cruise	

General		
Environment		Indoor / Outdoor
Controller Interface		RS-485
Operating Temperature	Indoor	0°C ~ 40°C (32°F ~ 104°F)
	Outdoor	- 40°C ~ 50°C (- 40°F ~ 122°F)
Dimension	Indoor	Ø 171.7 x 228.7 mm Ø 6.7 x 9 in.)
	Outdoor	Ø 191.9 x 382.1 mm (Ø 7.5 x 11.1 in.) w / Sunshield
Weight	Indoor	1.6 kg (3.57 lb)
	Outdoor	2.3 kg (5.11 lb)
Power Source	Indoor	AC 24V ± 10%
	Outdoor	AC 24V ± 10%
Power Consumption	Indoor	20 W
	Outdoor	50 W (w / Heater)
Regulatory		CE / FCC / RoHS / IP66 (Outdoor)

Appendix B: Switch Settings Index Table

Please refer to the switch settings below for Mini Speed Dome Camera's ID and protocol setup.

Camera ID Setup

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
0	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
23	ON	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
27	ON	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
29	ON	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
30	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
31	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
39	ON	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
43	ON	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
45	ON	OFF	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
46	OFF	ON	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
47	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
51	ON	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
53	ON	OFF	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
54	OFF	ON	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
55	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
57	ON	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
58	OFF	ON	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
59	ON	ON	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
60	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
61	ON	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
62	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF
63	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF
64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
71	ON	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
72	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
73	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
74	OFF	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
75	ON	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
76	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
77	ON	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
78	OFF	ON	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
79	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF	OFF
80	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
81	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
82	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
83	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
84	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
85	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
86	OFF	ON	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
87	ON	ON	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
88	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
89	ON	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
90	OFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
91	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
92	OFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF	OFF
93	ON	OFF	ON	ON	ON	OFF	ON	OFF	OFF	OFF
94	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF
95	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF
96	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
97	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
98	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
99	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
100	OFF	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
101	ON	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
102	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
103	ON	ON	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
104	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
105	ON	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
106	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF	OFF

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ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
107	ON	ON	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
108	OFF	OFF	ON	ON	OFF	ON	ON	OFF	OFF	OFF
109	ON	OFF	ON	ON	OFF	ON	ON	OFF	OFF	OFF
110	OFF	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF
111	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF
112	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
113	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
114	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
115	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
116	OFF	OFF	ON	OFF	ON	ON	ON	OFF	OFF	OFF
117	ON	OFF	ON	OFF	ON	ON	ON	OFF	OFF	OFF
118	OFF	ON	ON	OFF	ON	ON	ON	OFF	OFF	OFF
119	ON	ON	ON	OFF	ON	ON	ON	OFF	OFF	OFF
120	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
121	ON	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
122	OFF	ON	OFF	ON	ON	ON	ON	OFF	OFF	OFF
123	ON	ON	OFF	ON	ON	ON	ON	OFF	OFF	OFF
124	OFF	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF
125	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF
126	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF
127	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF
128	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
129	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
130	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
131	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
132	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
133	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
134	OFF	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
135	ON	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
136	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
137	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
138	OFF	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
139	ON	ON	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
140	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
141	ON	OFF	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
142	OFF	ON	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
143	ON	ON	ON	ON	OFF	OFF	OFF	ON	OFF	OFF
144	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
145	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
146	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
147	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
148	OFF	OFF	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
149	ON	OFF	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
150	OFF	ON	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
151	ON	ON	ON	OFF	ON	OFF	OFF	ON	OFF	OFF
152	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
153	ON	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
154	OFF	ON	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
155	ON	ON	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
156	OFF	OFF	ON	ON	ON	OFF	OFF	ON	OFF	OFF
157	ON	OFF	ON	ON	ON	OFF	OFF	ON	OFF	OFF
158	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF
159	ON	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF
160	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
161	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
162	OFF	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
163	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
164	OFF	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
165	ON	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
166	OFF	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
167	ON	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
168	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
169	ON	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
170	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
171	ON	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
172	OFF	OFF	ON	ON	OFF	ON	OFF	ON	OFF	OFF
173	ON	OFF	ON	ON	OFF	ON	OFF	ON	OFF	OFF
174	OFF	ON	ON	ON	OFF	ON	OFF	ON	OFF	OFF
175	ON	ON	ON	ON	OFF	ON	OFF	ON	OFF	OFF
176	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
177	ON	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
178	OFF	ON	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
179	ON	ON	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
180	OFF	OFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF
181	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF
182	OFF	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
183	ON	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF
184	OFF	OFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF
185	ON	OFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF
186	OFF	ON	OFF	ON	ON	ON	OFF	ON	OFF	OFF
187	ON	ON	OFF	ON	ON	ON	OFF	ON	OFF	OFF
188	OFF	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF
189	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF
190	OFF	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF
191	ON	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF
192	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
193	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
194	OFF	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
195	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
196	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
197	ON	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
198	OFF	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
199	ON	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
200	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
201	ON	OFF	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
202	OFF	ON	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
203	ON	ON	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
204	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
205	ON	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
206	OFF	ON	ON	ON	OFF	OFF	ON	ON	OFF	OFF
207	ON	ON	ON	ON	OFF	OFF	ON	ON	OFF	OFF
208	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
209	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
210	OFF	ON	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
211	ON	ON	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
212	OFF	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF
213	ON	OFF	ON	OFF	ON	OFF	ON	ON	OFF	OFF
214	OFF	ON	ON	OFF	ON	OFF	ON	ON	OFF	OFF
215	ON	ON	ON	OFF	ON	OFF	ON	ON	OFF	OFF
216	OFF	OFF	OFF	ON	ON	OFF	ON	ON	OFF	OFF
217	ON	OFF	OFF	ON	ON	OFF	ON	ON	OFF	OFF
218	OFF	ON	OFF	ON	ON	OFF	ON	ON	OFF	OFF
219	ON	ON	OFF	ON	ON	OFF	ON	ON	OFF	OFF
220	OFF	OFF	ON	ON	ON	OFF	ON	ON	OFF	OFF

ID No.	SWITCH SETTING									
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8	SW-9	SW-10
221	ON	OFF	ON	ON	ON	OFF	ON	ON	OFF	OFF
222	OFF	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF
223	ON	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF
224	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
225	ON	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
226	OFF	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
227	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
228	OFF	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF
229	ON	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF
230	OFF	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
231	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
232	OFF	OFF	OFF	ON	OFF	ON	ON	ON	OFF	OFF
233	ON	OFF	OFF	ON	OFF	ON	ON	ON	OFF	OFF
234	OFF	ON	OFF	ON	OFF	ON	ON	ON	OFF	OFF
235	ON	ON	OFF	ON	OFF	ON	ON	ON	OFF	OFF
236	OFF	OFF	ON	ON	OFF	ON	ON	ON	OFF	OFF
237	ON	OFF	ON	ON	OFF	ON	ON	ON	OFF	OFF
238	OFF	ON	ON	ON	OFF	ON	ON	ON	OFF	OFF
239	ON	ON	ON	ON	OFF	ON	ON	ON	OFF	OFF
240	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF
241	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF
242	OFF	ON	OFF	OFF	ON	ON	ON	ON	OFF	OFF
243	ON	ON	OFF	OFF	ON	ON	ON	ON	OFF	OFF
244	OFF	OFF	ON	OFF	ON	ON	ON	ON	OFF	OFF
245	ON	OFF	ON	OFF	ON	ON	ON	ON	OFF	OFF
246	OFF	ON	ON	OFF	ON	ON	ON	ON	OFF	OFF
247	ON	ON	ON	OFF	ON	ON	ON	ON	OFF	OFF
248	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF	OFF
249	ON	OFF	OFF	ON	ON	ON	ON	ON	OFF	OFF
250	OFF	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF
251	ON	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF
252	OFF	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF
253	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF
254	OFF	ON	ON	ON	ON	ON	ON	ON	OFF	OFF
255	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF

Protocol Setup

Protocol No.	SWITCH SETTING					
	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
0	OFF	OFF	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF
9	ON	OFF	OFF	ON	OFF	OFF
10	OFF	ON	OFF	ON	OFF	OFF
11	ON	ON	OFF	ON	OFF	OFF
12	OFF	OFF	ON	ON	OFF	OFF
13	ON	OFF	ON	ON	OFF	OFF
14	OFF	ON	ON	ON	OFF	OFF
15	ON	ON	ON	ON	OFF	OFF
16	OFF	OFF	OFF	OFF	ON	OFF
17	ON	OFF	OFF	OFF	ON	OFF
18	OFF	ON	OFF	OFF	ON	OFF
19	ON	ON	OFF	OFF	ON	OFF
20	OFF	OFF	ON	OFF	ON	OFF
21	ON	OFF	ON	OFF	ON	OFF
22	OFF	ON	ON	OFF	ON	OFF
23	ON	ON	ON	OFF	ON	OFF