Panasonic ideas for life

FULL-2WAY REMOTE LIGHTING CONTROL SYSTEM

Specifications are subject to change without notice.

For ENERGY SAVING
One 2 WIRE Bus
The Standard of Flexible, Functional, Energy-Efficient Lighting

Multiplex Transmission FULL-2WAY Remote Lighting Control System

Simple, Efficient Lighting Control That Matches Your Needs

Multiplex transmission FULL-2WAY remote control system uses just two \( \pm 24 \text{ V} \) signal wires for all the switches on a network, and controls lighting using pulse signals. This makes for a simple and flexible system that requires little maintenance. We’ve proven that highly functional systems do not require complex wiring. In wide use in many office buildings, these systems provide the standard for simple, efficient, and effective control.

Eco-friendly

Save-Energy, Save-Cost

Timers and sensors control the system to provide light only when needed. This cuts energy use and costs.

Simple Design and Labor-Saving Installation

The system employs a multiplex transmission method using two non-polarized signal wires. This drastically reduces the number of wires needed compared to conventional remote control wiring.

Amenity

Matches All Lighting Control Needs

You get lighting control to match your exact needs. With just a touch of a button, you can either turn on/off all lights in one area of the building, or turn on/off individual lights as required.

Convenience

Minimal Design, Minimum Maintenance

Because switch functions can be programmed after wiring is complete, the entire process is sped up—from design and estimating, to ordering, delivery, and installation. System functions can also be quickly and easily changed.

Flexibility

Flexibility Reduces Total Costs

There’s no need to modify the wiring if lighting control has to be changed due to room layout alterations. This contributes to reduced overall costs.

See these pages for specific information.

An outline of our systems

- System Outline
  - System Principle
  - Functions and Features of FULL-2WAY Remote Control
  - Examples of Building Applications
  - Recommending Renovation to Save Energy and Enhance Comfort
  - Operating Switches

For system designers

- Control Methods
  - Outline of Control Methods
  - Circuit Design for Individual Control
  - Circuit Design for Group Control
  - Circuit Design for Pattern Control
  - Relay Selecting Chart by Load Capacity
  - Circuit Design for 6A Contact Output T/U
  - Amplifier

- Basic Functions
  - FULL-2WAY System Components
  - Products
  - Plate
  - Functional Comparison for each Transmission Unit
  - Basic Specifications of FULL-2WAY Remote Control

For system estimates

- Design
  - System Design Examples
  - Address Setting Method for Dip Switch T/U
  - Specifications of Address Setting Unit
  - Address Setting Method for Infrared I/O Switches and T/U
  - Group and Pattern Control Program Setting Method

For installation

- Address Setting
  - Contact Input T/U
  - LCD Appellation Touch Switch
  - Switch (Eight Free Module)
  - Passive Infrared Unit Control
  - Daylight Sensor Control
  - Wireless Control
  - Dimmer Control for Incandescent lamps
  - Dimmer Control for Dimmable Ballast (0-10V DC Type)
  - Central Control and Programming Unit
  - Appellation Indication System & Card Operation Switch
  - Motor-Driven Control
  - Time Schedule Control

- Additional Functions
  - Notes on Installation

- Appendix
  - Trouble Shooting
New Product

FULL-2WAY Daylight Sensor Ceiling Unit (with Separate Setting Unit)
The separate setting unit is easy to set up because it is built into the wall.

(1) The sensor detects the outside light brightness to control interior lighting. 
Unnecessary lighting can be avoided while it is light outside.
(Rough guide for illuminance setting: 60 lx to 9080 lx)
(2) You can set the illuminance from the illuminance/address setting unit installed on the wall of a control room.
(3) Installation in a high ceiling of a station platform, factory, warehouse, etc. is recommended.

Applicable Transmission Unit is WRT2050 and WRT2040 Series.

Recommended cases

FULL-2WAY Eight-free Switch (infrared I/O)
The Key is Our Special Switching System.

Multiplex transmission FULL-2WAY wiring is designed differently than common wiring methods. 
Commands are signaled from remote locations and lighting is controlled using just two ±24V non-polarized wires, so installation labor costs decrease despite the increasing of building size.

• The difference in switching methods

The switch is located between the load and the power source, so it can directly turn the power on and off.

The remote control relay is located between the load and the power source. The switch acts as a signal transmitter, sending commands to the relay to turn the power on and off.

Remote Control

Common Control

Direct Control

Common wiring

This diagram illustrates the difference in systems. Compare an application of centralized monitoring and control of a load of eight circuits.

Common wiring method

This means a total of 9 power lines are needed to the centralized control switch section. This requires a thick conduit which the wires going to the switch.

FULL-2WAY remote control method

There are just two 24V signal wires to the centralized control switch section.

Wires going to the switch can be housed in a thin conduit.

Common wiring is suitable only for small-scale projects

FULL-2WAY remote control wiring

Wires going to the switch can be housed in a thin conduit.

FULL-2WAY Eight-free Switch (infrared I/O)

(1) Single-row size compact switch panel capable of containing up to eight switches
(2) Simple design to fit in an office space
(3) Finely-divided on/off groups to achieve smart energy-efficient lighting

Features

(1) Double-row size compact switch panel capable of containing up to 24 switches
(2) User-friendly name-touch operation
(3) Finely-divided on/off groups to achieve smart energy-efficient lighting

The backlight stays off unless a switch operation is performed

FULL-2WAY LCD Appellation Touch Switch

Features

The names of each switch can be displayed.
Depending on the usage, size of each switches can be adjusted.
(Max 8 switches / page, Max 3 pages)

Operation screen (Example)

FULL-2WAY Eight-free Switch (infrared I/O)

WRT2655-8
FULL-2WAY Daylight Sensor Ceiling Unit (with Separate Setting Unit)

WRT2661-8
FULL-2WAY LCD Appellation Touch Switch

WRT2651-8
FULL-2WAY Eight-free Switch (infrared I/O)
WRT2652-8
FULL-2WAY Eight-free Switch (infrared I/O)
WRT2653-8
FULL-2WAY Eight-free Switch (infrared I/O)
WRT2654-8
FULL-2WAY Eight-free Switch (infrared I/O)
WRT2658-8
FULL-2WAY Eight-free Switch (infrared I/O)

Recommended cases

Factories  Warehouses

• The backlight stays off unless a switch operation is performed

(1)(infrared I/O)

WRT5511-8
FULL-2WAY Eight-free Switch (infrared I/O)

WRT5512-8
FULL-2WAY Eight-free Switch (infrared I/O)

WRT5513-8
FULL-2WAY Eight-free Switch (infrared I/O)

WRT5514-8
FULL-2WAY Eight-free Switch (infrared I/O)

WRT5518-8
FULL-2WAY Eight-free Switch (Daylight Sensor Ceiling Unit)

WRT3655-8
FULL-2WAY Daylight Sensor Ceiling Unit (with Separate Setting Unit)

Installations in a high ceiling of a station platform, factory, warehouse, etc. is recommended.

Installation in a high ceiling of a station platform, factory, warehouse

The sensor detects the outside light brightness to control

The backlight stays off unless a switch operation is performed

The separate setting unit is easy to set up because it is built into the wall.

The backlight stays off unless a switch operation is performed

You can set the illuminance from the illuminance/address setting unit installed on the wall of a control room.

Finely-divided on/off groups to achieve smart energy-efficient lighting

Simple design to fit in an office space

Single-row size compact switch panel capable of containing up to eight switches

Common wiring FULL-2WAY remote control wiring

Multiplex transmission FULL-2WAY wiring is designed differently than common wiring methods. Commands are signaled from remote locations and lighting is controlled using just two ±24V non-polarized wires, so installation labor costs decrease despite the increasing of building size.

• The difference in switching methods

The switch is located between the load and the power source, so it can directly turn the power on and off.

The remote control relay is located between the load and the power source. The switch acts as a signal transmitter, sending commands to the relay to turn the power on and off.

Remote Control

Common Control

Direct Control

Common wiring

This diagram illustrates the difference in systems. Compare an application of centralized monitoring and control of a load of eight circuits.

Common wiring method

This means a total of 9 power lines are needed to the centralized control switch section. This requires a thick conduit which the wires going to the switch.

FULL-2WAY remote control method

There are just two 24V signal wires to the centralized control switch section.

Wires going to the switch can be housed in a thin conduit.

Common wiring is suitable only for small-scale projects

FULL-2WAY remote control wiring

Wires going to the switch can be housed in a thin conduit.

FULL-2WAY Eight-free Switch (infrared I/O)

(1) Single-row size compact switch panel capable of containing up to eight switches
(2) Simple design to fit in an office space
(3) Finely-divided on/off groups to achieve smart energy-efficient lighting

Features

(1) Double-row size compact switch panel capable of containing up to 24 switches
(2) User-friendly name-touch operation
(3) Finely-divided on/off groups to achieve smart energy-efficient lighting

The backlight stays off unless a switch operation is performed

FULL-2WAY LCD Appellation Touch Switch

Features

The names of each switch can be displayed.
Depending on the usage, size of each switches can be adjusted.
(Max 8 switches / page, Max 3 pages)

Operation screen (Example)
2-wire multiplex transmission technology helps to simplify lighting control system.

System Principle

Easy installation—just match to the applicable load and the switch T/U address.

Switch Transmission Unit Relay Control Terminal Unit (T/U) 20A HID Relay Fixture

Press the switch at #15 to turn ON.

1. The CN signal is sent from switch #15-2.
2. The switch signal is received by the transmission unit.
3. The transmission unit sends the instruction to the LED state from Green (OFF) to Red (ON).
4. The relay control T/U generates the current pulse to the relay connected at #15 output lead wire.
5. The relay receives the current pulse in the coil, which is mechanically linked with the operation of the main contact.
6. The HID relay has an auxiliary contact inside that the state of the main contact is turned on.
7. The HID relay has an auxiliary contact inside that the state of the main contact has been reversed.
8. The #15-2 relay has been reversed (from OFF to ON) from switch #15-2.
9. The relay control T/U sends the instruction to the LED state from Green (OFF) to Red (ON).
10. The auxiliary contact sends the current pulse to the relay connected at #15 output lead wire.
11. The relay receives the current pulse in the coil, which is mechanically linked with the operation of the main contact.
12. The HID relay has an auxiliary contact inside that the state of the main contact has been reversed.
13. The auxiliary contact has been reversed to state.
14. The control signal is sent through the T/U.
15. The T/U receives an auxiliary contact input that the state of the relay connected at #15 was changed.
16. The relay control T/U sends the instruction to the LED state from Green (OFF) to Red (ON).
17. The control signal is sent through the T/U.
18. The T/U receives an auxiliary contact input that the state of the relay connected at #15 was changed.

Specifications of the Transmission Unit

- Signal transmission method: Cyclical time sharing multiplex transmission with cut-in signal method
- Signal wires: Two wires with no polarity
- Signal voltage: 12V DC
- Output current: 500mA max.
- Transmission speed: Approx. 15 m/sec. per terminal unit (10kHz/sec.)
- Relay activation time: 0.2 sec. max.
- Max. number of circuits: 256 circuits
- Signal transmission distance: 500m max. with 1.2 mm dia. wire
- Total signal wiring length: 1,500m max. with 1.2 mm - dia wire
- Extension of transmission distance: with use of 5 amplifiers (WX 3913-80)
- Maximum signal wire distance: 3,000 m, Total signal wire length: 9,000 m
- Ambient temperature range: -10˚C to 50˚C
- Power failure backup: Flash memory for groups/patterns (no battery backup)

What is multiple transmission? The system transmits signals via two wires to circuits which are to be switched on and off. With FULL-2WAY multiple transmission, load addresses comprised of channel and load numbers are set up in advance, and the signal is transmitted to the designated addresses that correspond to remote controlled HID relays when switches are operated.

What is pulse signal? A pulse signal is a waveform with cut-in signal method.

With multiple transmission, the signal is transmitted by pulse signals. Reduced noise level with the special trapezoidal waveform for the pulse signal.

FULL-2WAY remote control system

- The multiplex transmission system allows 2 signal wires to control multiple loads.
- Load address for switches and T/Us need to be matched according to the load addressed.
- Transmission system features of FULL-2WAY remote control system

FULL-2WAY remote control has the cut-in method of high-speed control response and signal indication.

In addition to "CYCLIC TIME SHARING MULTIPLE TRANSMISSION METHOD", a new technology called the "CUT-IN SIGNAL CIRCUIT" can control relays at high speed and indicate on the ON/OFF status.
**Functions and Features of FULL-2WAY Remote Control**

**System Outline**

1. **Basic control**
   - Simple Design and Labor-Saving Installation
   - The system employs a multiplexed transmission system using two non-polarized signal wires. This reduces the number of wires needed compared to conventional remote control wiring.

2. **Amenity**
   - Amenity means user-friendly
   - Group control allows you to control multiple lighting, turning on or off all the lights in an entire section of the building with one switch. Pattern control allows you to match lighting to the time of day or to the work habits of people in the building.

3. **Convenience**
   - Minimal Design, Minimum Maintenance
   - With the compact wireless address setting unit, switch functions like pattern and group control along with delayed timing can be programmed after wiring is complete. This speeds up the entire process from design and estimate to ordering, delivery, and installation. The unit also allows you to quickly and easily change system functions.

4. **Flexibility**
   - Flexibility reduces total costs
   - There’s no need to modify the wiring if lighting control has to be changed due to room layout alterations. This contributes to reduced overall costs.

**Examples of Building Applications**

**Office Build.**

Centralized monitoring and control
- **Uses**
  - Offices
  - Conference rooms
- **Effect**
  - No re-wiring needed for lighting layout changes

**Pattern control**
- **Uses**
  - Office areas
  - Restrooms
  - Coffee rooms
  - Locker rooms
  - Elevator area
  - Lobby
- **Effect**
  - Energy saving
  - Reduced labor for control and management
  - Automated control of lighting

**Timer control**
- **Uses**
  - Building entrance
  - Lobby
  - Restrooms
  - Elevator area
  - Common areas: restrooms, stairwells
- **Effect**
  - Energy saving
  - Reduced labor for control and management

**Passive Infrared Sensor control**
- **Uses**
  - Entrance: 4
  - Coffee rooms
  - Restrooms
- **Effect**
  - Energy saving
  - Reduced labor for control and management

Remote controller allows you to manually adjust lighting, motorized equipment during meetings and conferences.
System Outline

Examples of Building Applications

**Recommendation Number 2**

**Factory**

Centralized monitoring and control

- Centralized monitoring and control of the lighting in the factory and offices can be carried out from the superintendent’s office.

**Group control**

- Lighting in entire sections of the factory or warehouse can be turned on or off all at once.

**Effect**

- Reduced labor for control and management
- Lights always turned on or off automatically

**Uses**

- Individual sections of factories
- Individual sections of warehouses
- Offices
- Conference rooms

**Gymnasium**

Centralized monitoring and control

- Lights of arena and seats can be checked at a glance and centrally controlled from a control room.

**Pattern control**

- Pattern control operation from various locations

**Effect**

- Presets lighting on or off when necessary
- Lights get turned on automatically when a person leaves
- Easy lighting control

**Uses**

- Factories
- Warehouses
- Elevator areas
- Staircases
- Restaurant areas
- Lobby
- Corridors
- Entrance

**Passive infrared sensor**

- Lights automatically turn on and off when people enter and leave.

**Effect**

- Energy saving
- Reduced labor for control and management
- Lights automatically turn on and off when people enter and leave.

**Uses**

- Arena
- Seating areas
- Locker rooms
- Restrooms
- Coffee rooms

**Restaurant**

Combined use of times and sensors

- Energy saving can be achieved by responding to the arrival pattern of customers and the amount of natural light.

**Effect**

- Energy saving
- Reduced labor for control and management
- Lighting can be turned off automatically during opening to closing time

**Uses**

- Inside the restaurant
- Outside light

**Multiple operation**

- Lighting control from multiple locations is possible from the cashier’s area and from the kitchen.

**Effect**

- Reduced labor for control and management

**Uses**

- Inside the restaurant
- Kitchen

**Pattern control**

- Single push of a switch creates ideal lighting environment according to the user’s needs.

**Effect**

- Energy saving
- Reduced labor for control and management

**Uses**

- Interiors
- Locker rooms
- Restrooms

**Pattern control**

- With passive infrared ceiling unit, a person need not be concerned with the setting of ON or OFF of lights in areas such as restrooms and locker rooms.

**Effect**

- Energy saving
- Reduced labor for control and management

**Uses**

- Locker rooms
- Restrooms

**Combined use of pattern and dimmer control**

- Passive infrared control

**Effect**

- Creating a bright atmosphere ideal for each season with only a single touch of a switch is possible.

**Uses**

- Inside the restaurant

**Pattern control**

- Switch installed near the front door to turn off all lights in a house under pattern control is convenient when leaving in a hurry.

**Effect**

- Preventing lights being left on
- Creating an effective atmosphere

**Uses**

- From door

**Centralized monitoring and control**

- Centralized monitoring and control of lights in all rooms from living room and kitchen allow to check the lights left on when not in use.

**Effect**

- Energy saving
- Reduced labor for control and management
- Energy saving can be achieved by responding to the arrival pattern of customers and the amount of natural light.

**Uses**

- In the living room
- In the kitchen

**Passive infrared sensor**

- Lighting control during lighting operation

**Effect**

- Instant switch in a room

**Uses**

- Passive Infrared Ceiling Unit

**Wireless control**

- Wireless control allows users to control lights of their own rooms from bed.

**Effect**

- Created a bright atmosphere ideal for each season with only a single touch of a switch is possible.

**Uses**

- Awake for the elderly

System Outline
For spaces such as offices and entire buildings
Realize greater energy savings by using a "Program Timer Unit" to control fixed schedule, reduced lighting
• Normal conditions
  98 W X 100 fixtures X 12 hours X 250 days = Annual amount of power consumption 29,400 kWh
  Energy savings 30%
• With program timer unit
  39 W X 150 fixtures X 10 hours X 50 fixtures X 2 hours X 250 days = Annual amount of power consumption 28,950 kWh
  Energy savings approximately 6%

For spaces such as restrooms and locker rooms
Realize greater energy savings by combining a "Passive Infrared Unit" to control off/on automatically
• Without a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 665.9 kWh
  Energy savings approximately 40%
• With a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 265.5 kWh
  Energy savings approximately 61%

For spaces such as areas near windows, corridors and elevator halls
Realize greater energy savings by combining a "Daylight Sensor Ceiling Unit" to control off/on automatically
• Normal conditions
  98 W X 10 fixtures X 15.5 hours X 250 days = Annual amount of power consumption 3,797.5 kWh
  Energy savings approximately 40%
• With daylight sensor ceiling unit
  98 W X 10 fixtures X 4.8 hours X 250 days = Annual amount of power consumption 1,176.0 kWh
  Energy savings approximately 68%

•ypsum outline
For spaces such as restrooms and locker rooms
Realize greater energy savings by combining a “Passive Infrared Unit” to control off/on automatically
• Without a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 665.9 kWh
  Energy savings approximately 40%
• With a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 265.5 kWh
  Energy savings approximately 61%

For spaces such as areas near windows, corridors and elevator halls
Realize greater energy savings by combining a “Daylight Sensor Ceiling Unit” to control off/on automatically
• Normal conditions
  98 W X 10 fixtures X 15.5 hours X 250 days = Annual amount of power consumption 3,797.5 kWh
  Energy savings approximately 40%
• With daylight sensor ceiling unit
  98 W X 10 fixtures X 4.8 hours X 250 days = Annual amount of power consumption 1,176.0 kWh
  Energy savings approximately 68%

•ypsum outline
For spaces such as restrooms and locker rooms
Realize greater energy savings by combining a “Passive Infrared Unit” to control off/on automatically
• Without a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 665.9 kWh
  Energy savings approximately 40%
• With a passive infrared unit
  (31 W X 5 + 22 W X 1 fixture) X 15.5 hours X 250 days = Annual amount of power consumption 265.5 kWh
  Energy savings approximately 61%

For spaces such as areas near windows, corridors and elevator halls
Realize greater energy savings by combining a “Daylight Sensor Ceiling Unit” to control off/on automatically
• Normal conditions
  98 W X 10 fixtures X 15.5 hours X 250 days = Annual amount of power consumption 3,797.5 kWh
  Energy savings approximately 40%
• With daylight sensor ceiling unit
  98 W X 10 fixtures X 4.8 hours X 250 days = Annual amount of power consumption 1,176.0 kWh
  Energy savings approximately 68%
Outline of Control Methods

**Basic Control Functions**

- **Num. of circuits to be controlled by one transmission unit:**
  Up to 256 circuits plus 16 dimmer circuits can be centrally monitored and controlled.
- **Multiple location operation:**
  Control from multiple locations is possible if you set the same address in the switches.

---

### Individual control

- **Operation:**
  Push to turn on (Push again to turn off)
- **Max. no. of circuits:**
  256 circuits (16 dimmer circuits [on/off only])
- **Address function:**
  Load address = load ch. X load no. 1st ch. 2nd ch. 3rd ch. 4th ch. 1 2 3 4 (on/off)
  Dimmer circuits = load ch. X 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
- **Example of pattern control settings:**
  Pattern 1 (P1)
  All lights on
  Pattern 2 (P2)
  All lights on
  Pattern 3 (P3)
  All lights on
  Pattern 4 (P4)
  All lights on

---

### Group control

- **Operation:**
  Push to turn on (Push again to turn off)
- **Max. no. of circuits:**
  127 groups
- **Address function:**
  Group addresses G1 - G127
- **Example of group control settings:**
  Group 1 (G1)
  Group 2 (G2)
  Group 3 (G3)

---

### Pattern control

- **Example of pattern control settings:**
  Lighting fixture layout. The squares represent the lighting fixtures. (One lighting fixture per one circuit.)

---

### Group control functions

- **Loads up to 256 circuits (16 dimmer circuits) can be turned on or off at once. Up to 127 groups can be programmed.

### Optional Control Functions

- **Function:**
  - Controls the brightness of an incandescent lamp in a single circuit.
  - Turns the lamp on or off with preset light levels.
  - Light level indicated on the dimmer switch.
  - On-timer control (On)/Off-delay control (Delay) (Incandescent lamp)
  - Group dimmer control (Dimmer circuits)
  - Fade control (Dimmer circuits)
- **Remarks:**
  - Off-delay time may be set in 30 seconds, 1 minute, 5 minutes, 60 minutes or 120 minutes.
  - On-timer function is applicable for individual, dimmer and group controls.

---

### Notes

- For a function comparison with the WRT2000 series, WRT2040 series and WRT2050 series Transmission Unit, see page 51.
- Dimmer, group and fade controls using individual address are not available for the WRT2000-82 Transmission Unit.
- When using dimmer control, dimmer addresses 1-16 are available, however, using individual addresses is recommended because group and fade controls are not available with dimmer addresses 1-16.

---

**Cautions:**

- For a function comparison with the WRT2000 series, WRT2040 series and WRT2050 series Transmission Unit, see page 51.
- Dimmer, group, and fade controls using individual address are not available for the WRT2000-82 Transmission Unit.

---

**Load (individual) addresses**

- **Circuits (Load ch. X Load no.)**
  - 1st ch. 2nd ch. 3rd ch. 4th ch.
  - 1 2 3 4
- **Dimmer circuits (Load ch. X 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15)**
- **Group addresses**
  - G1 - G127

---

**Address function**

- **Load address**
  - 0 ch-1, 0 ch-2, 0 ch-3, 0-ch 4

---

**Control Methods**
Basic Functions

Circuit Design for Individual Control

Individual control: Controls up to 256 circuits plus 16 dimmer circuits per system or per one transmission unit.

Address setting method for switches and T/Us (Infrared I/O): For details, see page 48.

Address setting method for T/Us (DIP switch): For details, see page 43.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.

Design Tips for Circuit Divisions

1. Install one transmission unit per system.
2. Determine a minimum control area and count the number of relays required for circuits. One transmission unit can control up to 256 circuits.
3. Check each load capacity per circuit, and for high power, specify 20A HID relays.

Panel configuration

Selector switch configuration

Determine the same number of individual switches as the circuits required for centralized monitoring and control.

Address setting method for the FULL-2WAY remote control.
Circuit Design for Group Control

- **Group control**: The basic circuit design is the same as the individual control. Up to 127 groups may be configured per system or per transmission unit.

**Simultaneously add group switches and a program setting unit to individual control circuits.**

- **Group control setting**: Can be performed by WRT9600-8. (Recommended for up to 50 circuits)

**Design Tips for Circuit Divisions**

1. **Panel configuration**
   - The configuration is the same as individual control circuit. (For details, see page 15.)

2. **Selector switch configuration**: Install a selector switch with program setting unit in the superintendent’s office, etc.

3. **Local switches**
   - Install switches for the required number of groups and for the number of multi-location control points.
   - **Make sure** that the pattern address on the local switch matches that of the selector switch to enable control from multiple locations.

**Address Setting at Local Switch**: Assign the same address on the local switch to match that of the selector switch.

**Address Setting at Local Switch**

1. Set the addresses of the selector switch using the Wireless Programming Unit or the Wireless Address Setting Unit. (For details, see page 45)
2. Set the control range, using selector switch, or using wireless programming unit.
3. Assign the same group address on the local switch to match that of the group control using Wireless programming unit or Wireless address setting unit. (For details, see page 45)

**LED Indications for Group Switch**

1. **Green (with LED on)**: State of every individual switch in the pattern matches
2. **Red with LED on**: State of every individual switch in the group is turned off.
3. **Green LED on a group switch lights** when all individual switches programmed in the group are turned on.
4. **Red LED on a group switch lights** when all individual switches programmed in the group are turned off.
5. **Turning one individual switch in the group on/off does not change the Red LED state on the group switch.**
6. **The load status should not be monitored from a central location by a group switch.**

**Basic Wiring Diagram for Group Control**

- **Individual control**: 16 circuits
- **Group control**: 4 groups

**Circuit Design for Pattern Control**

- **Pattern control**: The basic circuit design is the same as the individual control. Up to 72 patterns may be configured per system or transmission unit.

**Simultaneously add pattern switches and a program setting unit to the individual control circuits.**

- **Pattern control setting**: Can be performed with the WRT9600-8. (Recommended for up to 50 circuits)

**Design Tips for Circuit Divisions**

1. **Panel configuration**
   - The configuration is the same as individual control circuit. (For details, see page 15.)

2. **Selector switch configuration**: Install a selector switch with Program Setting Unit in the superintendent’s room, etc.

3. **Local switches**
   - Install switches for the required number of groups and for the number of multi-location control points.
   - **Make sure** that the pattern address on the local switch matches that of the selector switch to enable control from multiple locations.

**Address Setting at Local Switch**: Assign the same pattern address on the local switch to match that of the selector switch.

**Address Setting at Local Switch**

1. Set the addresses of the selector switch using the Wireless Programming Unit or the Wireless Address Setting Unit. (For details, see page 45)
2. Set the pattern control range, using selector switch, or using wireless programming unit.
3. Assign the same pattern address on the local switch to match that of the pattern control using Wireless programming unit or Wireless Address Setting Unit. (For details, see page 45)

**LED Indications for Group Switch**

1. **Green (with LED on)**: State of every individual switch in the pattern matches
2. **Red with LED on**: State of every individual switch in the pattern is turned off.
3. **Green LED on a group switch lights** when all individual switches programmed in the pattern are turned on.
4. **Red LED on a group switch lights** when all individual switches programmed in the pattern are turned off.
5. **Turning one individual switch in the pattern on/off does not change the Red LED state on the group switch.**
6. **The load status should not be monitored from a central location by a group switch.**

**Basic Wiring Diagram for Pattern Control**

- **Individual control**: 16 circuits
- **Pattern control**: 4 patterns

**Basic Functions**

- **Circuit Design for Group Control**
- **Circuit Design for Pattern Control**
Remote control relay selecting setting

Basic Functions

When you want to keep the relay control panel compact.

How to select the relay to be used

Choose relays based on the capacity of the load.

Insulation resistance

Dielectric strength

Deciding where to install relays

Relays are easily installed into a relay control panel. However, in the following cases, relays can be installed in sobred areas, such as on ceilings and inside lighting fixtures.

1) When the ELS is not to be used.
2) When you want to keep the relay panel compact.
3) When you want to reduce lighting wiring coming from the relay control panel.

Recommended relay by number of poles

Configuration

Relay Control T/U + 20A HID Relay + Transformer

Installation

6A Contact Output T/U (no transformer needed)

Relay control panel

20A max.

6A max. (not for use with HID loads)

JIS approved dimensions (1)

Contact arrangement

Main circuit

Auxiliary circuit

20A HID Relay with JIS approved dimensions (1) designed for a more compact relay control panel

10A Contact Output T/U

Relay control panel

Specs

Signal Current Consumption

Less than 3 mA

Power source

Unit

From ± 10 A 110-240 Vac

Unit

To Transmission

Unit

0-3

0-2

0-2

0-3

WRT2050-80

WR3426K-8 6A Contact Output T/U Specifications

WR1619K-8 / WR1613K-8 : Contact Output Specifications

WR6166-8/W6166-84 : Contact Output Specifications

WR6172-8/W6173-8 : Contact Output Specifications

WR3426K-8/WRT412K-8 : 6A Contact Output T/U Specifications

WR412K-8 : UL/c-UL marking Specifications

Relay Control T/U + 6A HID Relay + Transformer

20A HID Relay (Single Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay (Double Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay, 10A Contact Output T/U (in 3-Circuit)

Recommended relay by number of poles

Power source

Unit

From ± 10 A 110-240 Vac

Unit

To Transmission

Unit

0-3

0-2

0-2

0-3

WRT2050-80

WR3426K-8 6A Contact Output T/U Specifications

WR1619K-8 / WR1613K-8 : Contact Output Specifications

WR6166-8/W6166-84 : Contact Output Specifications

WR6172-8/W6173-8 : Contact Output Specifications

WR3426K-8/WRT412K-8 : 6A Contact Output T/U Specifications

WR412K-8 : UL/c-UL marking Specifications

Relay Control T/U + 6A HID Relay + Transformer

20A HID Relay (Single Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay (Double Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay, 10A Contact Output T/U (in 3-Circuit)

Recommended relay by number of poles

Power source

Unit

From ± 10 A 110-240 Vac

Unit

To Transmission

Unit

0-3

0-2

0-2

0-3

WRT2050-80

WR3426K-8 6A Contact Output T/U Specifications

WR1619K-8 / WR1613K-8 : Contact Output Specifications

WR6166-8/W6166-84 : Contact Output Specifications

WR6172-8/W6173-8 : Contact Output Specifications

WR3426K-8/WRT412K-8 : 6A Contact Output T/U Specifications

WR412K-8 : UL/c-UL marking Specifications

Relay Control T/U + 6A HID Relay + Transformer

20A HID Relay (Single Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay (Double Pole) JIS approved dimensions (1) (with Auxiliary Contact)

20A HID Relay, 10A Contact Output T/U (in 3-Circuit)
Circuit Design for 6A-10A Contact Output T/U (Dip Switch)

- **Features**
  6A, 10A Contact Output Terminal Units do not require a transformer, thus allowing more compact relay control panels.

Mounting space can be reduced to half.
- The use of 6A Contact Output T/U does not require a transformer. T/U relay itself is one unit, thus reduction of space and cost can be achieved.

- **20A HID Relay**
- **6A Contact Output T/U**

Address Setting for 6A-10A Contact Output T/U (4-Circuit)

Set addresses using the dip switches on the T/U. (Set address 21, 22, 23, 6 may be visually confirmed.) (For address settings, see page 43.)

- 6A Contact Output T/U (Single Pole) (WR3416K-8)
- 10A Contact Output T/U (Single Pole) (WR3443-8)

Wiring Diagram

- **Power source**
- **Transmission Unit**
- **Amplifier**

Circuit Design for Relay Control T/U (Infrared I/O) and 6A Contact Output T/U (Infrared I/O)

- **Features**
  Different load channel can be set to a Single Relay Control T/U (or a Single 6A Contact Output T/U)

Wiring Diagram

- **Power source**
- **Transmission Unit**
- **Amplifier**

Circuit Design for Relay Control T/U (Infrared I/O) and 6A Contact Output T/U (Infrared I/O)

- **Features**
  Different load channel can be set to a Single Relay Control T/U (or a Single 6A Contact Output T/U)

Wiring Diagram

- **Power source**
- **Transmission Unit**
- **Amplifier**

For Small-capacity Load (6A max.) per Circuit

Address setting

- Initial
- Controlled
- Individual
- Special

**T/U input**
- Relay T/U
- Dimmer T/U

**Indication**
- Low Battery
- Dimmer level

Transmission Unit to Amplifier

- A 500mA signal current is supplied per Amplifier.
- Output signal current from a Transmission Unit is 500mA. Be sure to use an Amplifier when the total signal current of components, such as Switches and Relay Control T/U, exceeds 500mA.

Amplifier

1. **Calculation method for FULL-2WAY signal current**

   - It is recommended, when using infrared I/O Switches, to install one Amplifier per approx 50 relay circuits.
   - Ex. 50 circuits (signal current consumption)
     - Relay control T/U ———— WR3440-8 1.2mA X 13
     - Selector switch section
       - Individual switches ———— WR5554-8 12mA X 13
       - Pattern switch ———— WR5554-8 12mA X 1
     - Program setting unit ———— WR5550-8 5mA X 1
     - Local switches ———— WR5551-8 6mA X 1
   - Total signal current consumption: 489mA

2. **Calculation method for FULL-2WAY signal wire length**

   - It is recommended that communication cable (CPEV) be used for signal lines to differentiate them from power lines and prevent their miswiring, though general-purpose electric wires can be used for signal line.

   - **Signal wires**
     - 1.2mm diameter, 1.25mm² or more
     - Maximum wiring length: Wiring length of \( x + \cdots + x \) or \( x + \cdots + x \) is 500m max.
     - Total wiring length: Total wiring length of \( x + \cdots + x \) or \( x + \cdots + x \) is 1,500m max.
     - Installation of an Amplifier can extend 500m for the max wiring length and 1,500m total length.
     - When a maximum number of five Amplifiers are used in a system, wiring can be extended to 3,000m for the maximum wire distance, and 9,000m for total wire length.
FULL-2WAY System Components

Distribution Panel Board and Relay Control Panel

Central Control and Programming Unit

Selector Switch

Passive Infrared Ceiling Unit

Daylight Sensor Ceiling Unit

Card Operation Switch

Inside Relay Control Panel

Transmission Unit

Relay Control T/U

Transformer 20A HID Relay

Amplifier

Contact Input T/U

Dimmer Control T/U (500W)(230V)

10A Contact Output T/U

Legend:
- FULL-2WAY Signal line (2 wires)
- Wireless Signal line (2 wires)
- Power line

Contact Input T/U

Switches (Eight Free Module)

Switches (COSMO Module)

Master Switch (20)

Also Available
44 Circuit (WRT6144WK-8)
68 Circuit (WRT6168WK-8)

Legend:
- FULL-2WAY Signal line (2 wires)
- Wireless Signal line (2 wires)
- Power line

Contact Input T/U

Switches (Eight Free Module)

Switches (COSMO Module)

Master Switch (20)

Also Available
44 Circuit (WRT6144WK-8)
68 Circuit (WRT6168WK-8)

Legend:
- FULL-2WAY Signal line (2 wires)
- Wireless Signal line (2 wires)
- Power line
Switches

Switches (COSMO Module)  For applicable plates, see page 35.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5503WK-8</td>
<td>Switch (1) (Infrared I/O) (COSMO Module) (White)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5502WK-8</td>
<td>Switch (2) (Infrared I/O) (COSMO Module) (White)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5501WK-8</td>
<td>Switch (3) (Infrared I/O) (COSMO Module) (White)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5731WK-8</td>
<td>Dimmer Switch (Infrared I/O) (COSMO Module) (White)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Switches (Eight Free Module)  For details of plates to use, see page 35.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5511-8</td>
<td>Switch (1) (Infrared I/O) (Eight Free Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5512-8</td>
<td>Switch (2) (Infrared I/O) (Eight Free Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5513-8</td>
<td>Switch (3) (Infrared I/O) (Eight Free Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5514-8</td>
<td>Switch (4) (Infrared I/O) (Eight Free Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Switches (FULL-COLOR Module)  For applicable plates, see page 36.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5551-8</td>
<td>Switch (1) (infrared I/O) (FULL-COLOR Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5552-8</td>
<td>Switch (2) (infrared I/O) (FULL-COLOR Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5553-8</td>
<td>Switch (3) (infrared I/O) (FULL-COLOR Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT5554-8</td>
<td>Switch (4) (infrared I/O) (FULL-COLOR Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Switches, Setting Devices

Switches (GLACIER Series)  For details of plates to use, see page 35.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT6024WK-8</td>
<td>Switch (1) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6048WK-8</td>
<td>Switch (2) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6120WK-8</td>
<td>Switch (3) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6144WK-8</td>
<td>Switch (4) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6072WK-8</td>
<td>Switch (5) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6168WK-8</td>
<td>Switch (6) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6032WK-8</td>
<td>Switch (7) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6120WK-8</td>
<td>Switch (8) (Infrared I/O) (GLACIER Series) (Silver Gray)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Master Switches (Surface Mount)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT6012WK-8</td>
<td>Master Switch (20) (with Program Setting Unit)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6014WK-8</td>
<td>Master Switch (40) (with Program Setting Unit)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6016WK-8</td>
<td>Master Switch (60) (with Program Setting Unit)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6018WK-8</td>
<td>Master Switch (80) (with Program Setting Unit)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
<tr>
<td>WRT6020WK-8</td>
<td>Master Switch (100) (with Program Setting Unit)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Program Setting Unit  For setting details, please see pages 49 & 50.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5855-8</td>
<td>Program Setting Unit (FULL-COLOR Module)</td>
<td>Signal current: 0.5 mA</td>
<td></td>
</tr>
</tbody>
</table>

Notice: Our remote control system products are not compatible with those of other manufacturers and should not be used in combination with any such products. Always use Mitsubishi Electric Co., Ltd. remote control relays, breakers and transformers. Always use WRT5**** series Transmission Unit when using infrared I/O address type components.
Transmitter, Amplifier, Transformer

Wireless Programming Unit

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT7506K-B</td>
<td>Wireless Programming Unit (With Address Setting Function)</td>
<td>Rated voltage 110/240 V (2-wire 5-wire)</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wireless Address Setting Unit

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5655K-B</td>
<td>Wireless Address Setting Unit</td>
<td>Rated voltage 110/240 V (2-wire 5-wire)</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Central Control and Programming Unit

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT5193K-B</td>
<td>Central Control and Programming Unit (Panel Use)</td>
<td>Rated voltage 110/240 V</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transmission Units

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT3250-8</td>
<td>Transmission Unit (Panel Use) (100-240 V AC)</td>
<td>Rated voltage 110/240 V</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Amplifier

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT3912K-B</td>
<td>Amplifier (Panel Use) (100-240 V AC)</td>
<td>Rated voltage 100-240 V</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transformers

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT3911-8</td>
<td>Transformer (Panel Use) (208V AC)</td>
<td>Rated voltage 115-240 V</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Relay Control T/U

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT960-8</td>
<td>Relay Control T/U (2-Circuit)</td>
<td>Rated voltage 24V DC</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Master Wireless Control

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Number of connections (max)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT13906-8</td>
<td>Master Wireless Switch (Ceiling and Flush Mount)</td>
<td>Rated voltage 24V DC</td>
<td>500 operations</td>
<td>With Address Setting Unit (Panel Use)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Signal current 2.5 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24V AC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20A HID Relays

- Signal current: Rated input signal current (Name displayed on units)
- Dimensions (units: mm)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Output side: 20 A 300V AC</th>
<th>Input side: 20 A 300V AC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR6166-84</td>
<td>20A HID Relay (Single Pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR6166K-84</td>
<td>20A HID Relay (Double Pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR6172-84</td>
<td>20A HID Relay (Double Pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR61723-84</td>
<td>20A HID Relay (Double Pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10A Contact Output T/U  — See page 21 for details.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Output side: 20 A 300V AC</th>
<th>Input side: 20 A 300V AC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR7443-8</td>
<td>10A Contact Output T/U (single pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR7443K-8</td>
<td>10A Contact Output T/U (double pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6A Contact Output T/U(Panel Use)(DIP switch)  — See page 21 for details.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Output side: 6A 300V AC</th>
<th>Input side: 20 A 300V AC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR6416K-8</td>
<td>6A Contact Output T/U (single pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR6416K8I-8</td>
<td>6A Contact Output T/U (infrared I/O)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6A Contact Output T/U(Panel Use)(Infrared I/O)  — See page 21 for details.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Output side: 6A 300V AC</th>
<th>Input side: 20 A 300V AC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR7442K-8</td>
<td>6A Contact Output T/U (single pole)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6A Contact Output T/U(Non-volatile)  — See page 21 for details.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Output side: 6A 300V AC</th>
<th>Input side: 20 A 300V AC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR7442K8I-8</td>
<td>6A Contact Output T/U (infrared I/O)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimmer Control

- Signal current: Rated input signal current (Name displayed on units)

### Dimmer Units

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT4244-8</td>
<td>Dimmer Unit for 500W Incandescent Lamp (Infrared (I/O) Panel Use)</td>
<td>Signal current: 5mA at 500V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT4245-8</td>
<td>Dimmer Unit for 500W Incandescent Lamp (Infrared (I/O) Panel Use)</td>
<td>Signal current: 5mA at 500V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT4344-8</td>
<td>Dimmer Unit for 800W Incandescent Lamp (Panel Use)</td>
<td>Signal current: 5mA at 800V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT4446-8</td>
<td>Dimmer Unit for 1500W Incandescent Lamp (Infrared (I/O) Panel Use)</td>
<td>Signal current: 5mA at 1500V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT3240-8</td>
<td>Contact Input T/U (1 Input) (Infrared (I/O) Panel Use)</td>
<td>Signal current: 2.3mA at 50V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT3241-8</td>
<td>Contact Input T/U (1 Input) (Non-volatile (I/O) Panel Use)</td>
<td>Signal current: 2.3mA at 50V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT5771-8</td>
<td>Dimmer Switch (Infrared (I/O) Type) (FULL-COLOR Module)</td>
<td>Signal current: 10mA</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT5770-8</td>
<td>Dimmer Switch (Infrared (I/O) Type) (FULL-COLOR Module)</td>
<td>Signal current: 10mA</td>
<td>Dimensions (units: mm)</td>
</tr>
</tbody>
</table>

### Motor-Drive Control, Relay Status Control, Contact Input T/U

- Signal current: Rated input signal current (Name displayed on units)

### Motor-Drive Control

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
<th>Rating</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRT4421-8</td>
<td>Motor Drive T/U 1 Pulse Output, Stop Terminal N.O. Type (Infrared (I/O) Panel Use)</td>
<td>Signal current: 2.3mA at 300V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT4422-8</td>
<td>Motor Drive Terminal Unit (Infrared (I/O) Panel Use)</td>
<td>Signal current: 2.3mA at 300V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
<tr>
<td>WRT4622-8</td>
<td>Control Switch (Infrared (I/O) Type) (COSMO Module) (White)</td>
<td>Signal current: 2.3mA at 300V AC Voltage Applicable for incandescent lamp only (Non-volatile memory used)</td>
<td>Dimensions (units: mm)</td>
</tr>
</tbody>
</table>

### Relay Status T/U

- Signal current: Rated input signal current (Name displayed on units)

### Contact Input T/U (Infrared (I/O))

- Signal current: Rated input signal current (Name displayed on units)

### Signal Line Monitoring Unit

- Signal current: Rated input signal current (Name displayed on units)
**Program Timer Unit**

- **Model No.:** WRT3540K-8
- **Description:** Program Timer Unit (External Clock Type, 2A AC)
- **Signal current:** Rated input signal current (Name displayed on units)
- **Dimension:** Width 35 mm

**Daylight Sensor Ceiling Unit**

- **Model No.:** WRT3655-8
- **Description:** Daylight Sensor Ceiling Unit (Infrared I/O)
- **Signal current:** Rated input signal current (Name displayed on units)
- **Dimension:** Width 35 mm

**Passive Infrared Ceiling Units & Daylight Sensor**

- **Model No.:** WRT3374K-8
- **Description:** Auxiliary Passive Infrared Ceiling Unit (Flush Mount)
- **Signal current:** 20 mA

- **Model No.:** WRT3364K-8
- **Description:** Auxiliary Passive Infrared Ceiling Unit (Wide Detection Area Type, with Photosensor)
- **Signal current:** 22 mA

- **Model No.:** WRT3365-8
- **Description:** Auxiliary Passive Infrared Ceiling Unit (Wide Detection Area Type, with Photosensor)
- **Signal current:** DC 12 V

- **Model No.:** WRT3366K-8
- **Description:** Auxiliary Passive Infrared Ceiling Unit (Wide Detection Area Type, with Photosensor)
- **Signal current:** DC 12 V

**Passive Infrared Timer Unit**

- **Model No.:** WRT3374-8
- **Description:** Passive Infrared Ceiling Unit (Infrared I/O)
- **Signal current:** 20 mA

Note: Passive Infrared Ceiling Unit is only available for lighting control. Do not use to control non-lighting loads such as electrical equipment, air conditioning equipment, and alarm systems. Doing so may cause malfunctions and lead to accident or injury.
### COSMO Module Plates Applicable to Switches (White)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1-4</td>
<td>WTC7101W-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2-8</td>
<td>WTC7102W-8</td>
</tr>
<tr>
<td>3</td>
<td>3-12</td>
<td></td>
<td>WTC7103W-8</td>
</tr>
<tr>
<td>4</td>
<td>4-16</td>
<td></td>
<td>WTC7104W-8</td>
</tr>
</tbody>
</table>

### COSMO Module Plates Applicable to Switches (Aluminum)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1-4</td>
<td>WTC6301-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2-8</td>
<td>WTC6302-8</td>
</tr>
<tr>
<td>3</td>
<td>3-12</td>
<td></td>
<td>WTC6303-8</td>
</tr>
<tr>
<td>4</td>
<td>4-16</td>
<td></td>
<td>WTC6304-8</td>
</tr>
<tr>
<td>5</td>
<td>5-20</td>
<td></td>
<td>WTC6305-8</td>
</tr>
<tr>
<td>6</td>
<td>6-24</td>
<td></td>
<td>WTC6306-8</td>
</tr>
</tbody>
</table>

### GLACIER Series Plates applicable to Switches (GLACIER Type)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1-4</td>
<td>WTV6101S1-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2-8</td>
<td>WTV6102S1-8</td>
</tr>
<tr>
<td>3</td>
<td>3-12</td>
<td></td>
<td>WTV6103S1-8</td>
</tr>
</tbody>
</table>

### FULL-COLOR Module Plates

#### FULL-COLOR Module Plates Applicable to Switches (White)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>WPTC3111W</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>WPTC3112W</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2</td>
<td>WPTC3113W</td>
</tr>
</tbody>
</table>

### FULL-COLOR Module Plates Applicable to Switches (Aluminum)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>WN7501-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>WN7502-8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2</td>
<td>WN7503-8</td>
</tr>
</tbody>
</table>

### FULL-COLOR Module Plates Applicable to Switches (Stainless Steel)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>WN7501-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>WN7502-8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2</td>
<td>WN7503-8</td>
</tr>
</tbody>
</table>

### Decorative Plates

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>WTV6101S1-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>WTV6102S1-8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>WTV6103S1-8</td>
</tr>
</tbody>
</table>

### Special Plates Applicable to Switches (Aluminum)

<table>
<thead>
<tr>
<th>No. of rows</th>
<th>No. of gangs</th>
<th>No. of circuits</th>
<th>Model No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>WN7501-8</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
<td>WN7502-8</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>WN7503-8</td>
</tr>
</tbody>
</table>

---

For hole size No. see page 37.
## Functional Comparison for each Transmission Unit

It is recommended to use a dimmer control with an individual address when using the WRT2050 series.

### Transmission Units

<table>
<thead>
<tr>
<th>Function</th>
<th>No. of applicable circuits</th>
<th>WRT2000 Series</th>
<th>WRT2040 Series</th>
<th>WRT2050-80</th>
<th>Now Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual control</td>
<td>256 circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using individual addresses</td>
<td>16 dimmer circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(On or off only)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimmer control</td>
<td>Using individual addresses</td>
<td>256 circuits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimmer circuits on or off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using dimmer address</td>
<td>16 dimmer circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group control</td>
<td>Using individual addresses</td>
<td>256 circuits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimmer circuits on or off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using dimmer address</td>
<td>16 dimmer circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern control</td>
<td>Dimmer circuits using individual addresses</td>
<td>256 circuits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimmer circuits on or off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using dimmer address</td>
<td>16 dimmer circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed control</td>
<td>Dimmer circuits using individual addresses</td>
<td>256 circuits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimmer circuits on or off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using dimmer address</td>
<td>16 dimmer circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mounting method

1. Mount Switch on Switch Mounting Frame from the rear using the screws.
2. Connect signal wires to Switches.
3. Mount Switch Mounting Frame on Box using Box screws.
4. Mount Plate using Plate screws.

### Calculating Outside Dimensions of Applicable Box to Relay Panel (Box with Flat Board: Surface and Flush Mount)

- **Special Switch Plates**
- **Special Switches Plates**
- **4 Gangs 5 Gangs 8 Gangs 7 Gangs 6 Gangs**
- **1-6 gangs applicable to the standard flush mount boxes**
- **Mounting method**
- **Wiring Control**
- **On-timer control/Off-delay control, Wireless control**
- **Powered-equipment control, Fan motor control, Volume control**

### Control by external devices

- **On-timer control/Off-delay control, Wireless control**
- **Powered-equipment control, Fan motor control, Volume control**

### Functional Comparison for each Transmission Unit

- **Individual**
- **Group**
- **Pattern**
- **Fade**

### It is recommended to use a dimmer control with an individual address when using the WRT2050 series.
### Basic Specifications of FULL-2WAY Remote Control

- **Using the WRT2050 series Transmission Unit**

<table>
<thead>
<tr>
<th>Basic specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission method</td>
</tr>
<tr>
<td>Signal wires</td>
</tr>
<tr>
<td>Signal voltage</td>
</tr>
<tr>
<td>Transmission speed</td>
</tr>
<tr>
<td>Relay activation time</td>
</tr>
<tr>
<td>Output current</td>
</tr>
<tr>
<td>Maximum number of circuits</td>
</tr>
<tr>
<td>Ambient temperature range</td>
</tr>
<tr>
<td>Power failure backup</td>
</tr>
</tbody>
</table>

- **Electric wire diameter and length**

<table>
<thead>
<tr>
<th>Wire type</th>
<th>Maximum length of wiring (Max. distance from a transmission unit to switch or T/U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø0.76mm</td>
<td>500m</td>
</tr>
<tr>
<td>Ø0.5mm</td>
<td>300m</td>
</tr>
<tr>
<td>Ø0.3mm</td>
<td>200m</td>
</tr>
<tr>
<td>Ø0.250mm</td>
<td>100m</td>
</tr>
</tbody>
</table>

**Note:**
- 1: Recommended signal wire.
- 2: Due to pulse signal duty cycle, the tester does not give an accurate display.

- **Using the WRT2050 series Transmission Unit**

<table>
<thead>
<tr>
<th>Basic control functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using the WRT2050 series Transmission Unit</td>
</tr>
<tr>
<td>See page 22 for details.</td>
</tr>
<tr>
<td><strong>Group dimmer control</strong></td>
</tr>
<tr>
<td>(incandescent lamp)</td>
</tr>
<tr>
<td>Dimmer control</td>
</tr>
<tr>
<td>(inverter fluorescent lamp)</td>
</tr>
</tbody>
</table>

#### System Design Examples

- **House**

1. A Master switch is installed in a living room or a dining room to centrally monitor and control all the lights in a house.
2. Dimming control for the living room is achieved by selecting the ideal lighting level to suit the situation.
3. Pattern control of “going out” scene is convenient when going out.

- **Plan**

#### Design

- **Features of a system**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Switch</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
<tr>
<td>Group Switch</td>
<td></td>
<td></td>
<td></td>
<td>Group Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Individual Switch</td>
<td></td>
<td></td>
<td></td>
<td>Individual Switch installed to control brightness of controlable lamps</td>
</tr>
</tbody>
</table>

#### Components

- **Living room**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Switch 6</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch 3</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

- **Kitchen**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Switch 2</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

- **Bathroom**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Switch 3</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

- **Dining room**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Switch 3</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

- **Bedroom**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Switch 4</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

- **Living room**

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Legend</th>
<th>Quantity</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceiling Switch 4</td>
<td></td>
<td></td>
<td></td>
<td>Centre control and control of all lights from a single location</td>
</tr>
<tr>
<td>On-timer Switch</td>
<td></td>
<td></td>
<td></td>
<td>On-timer control programming</td>
</tr>
<tr>
<td>Dimmer Switch 2</td>
<td></td>
<td></td>
<td></td>
<td>Dimmer Switch installed to control brightness of controlable lamps</td>
</tr>
<tr>
<td>Off-delay Switch</td>
<td></td>
<td></td>
<td></td>
<td>Off-delay Switch installed for incandescent lamps</td>
</tr>
</tbody>
</table>

#### Electric wire diameter and length

See page 22 for details.
System Design Examples

1. Outline of Lighting Control System
   - Outline of Remote Lighting Control System: This remote lighting control system uses a multiplex transmission.
     1. A master switch is installed on a panel board in a control room to perform pattern control on each floor (all lights on, some lights on, and all lights off for public areas and all lights off for offices). Pattern and group controls shall be programmed by a Master Switch.
     2. Group switches are used to collectively turn on and off lights for each department in the office.
     3. Lighting can be controlled automatically by a Timer Setting Unit.
     4. Relays and a Relay Control T/U shall be installed in a distribution panel.

2. Outline of Remote Lighting Control System
   - Components:
     - Address Setting Unit
     - Transmission Unit (CPU) installed
     - Amplifier installed for amplification of signal current
     - Relay Control T/U
     - Program Timer Unit
     - Contact Input T/U
     - Program Setting Unit
     - Switch (4)
     - Transformer
     - Relay Control T/U
     - Relay No.
     - Relay (double pole)
     - Relay (double pole)

3. System Diagram
   - [Diagram]

4. Panel List
   - Panel:
     - Power Supply: 3 W 110/220V AC
     - Main Breaker: 2P25/00
     - Circuit No.: 1138
     - Circuit Breaker: 1138
     - Relays: 3W/7.5A
     - Type of Load: 220V-230V
     - Remarks: Guide lamp

5. Floor Plan Example
   - [Diagram]

6. Office
   - [Diagram]

Legend:
- MR: Master Switch
- RG: Individual Switch
- R: Group Switch
- 1F: First Floor
- 2F: Second Floor
- 3F: Third Floor
- Corridor
- Conference Room
- Office
- Lobby
- [Diagram]
Address Setting Method for Dip Switch T/Us

**Relay Control T/U and 6A-10A Contact Output T/U (4-Circuit)**

- Load numbers 1, 2, 3, and 4 are fixed.

**Address Setting Method for Dip Switch T/Us**

\[
\text{Load Address} + \text{Load Channel (ch)} + \text{Load Number (No.)} = 256 \text{ circuits (64 ch X 4)}
\]

**Example**

\[
\begin{array}{c}
32 \times 16 \times 8 \times 4 \times 2 \times 1 \\
0 + 0 + 0 + 0 + 0 + 0 \\
\text{Load No. 1}
\end{array}
\]

\[
\begin{array}{c}
32 \times 16 \times 8 \times 4 \times 2 \times 1 \\
0 + 0 + 0 + 0 + 0 + 1 \\
\text{Load No. 2}
\end{array}
\]

\[
\begin{array}{c}
32 \times 16 \times 8 \times 4 \times 2 \times 1 \\
0 + 0 + 0 + 0 + 1 + 0 \\
\text{Load No. 3}
\end{array}
\]

\[
\begin{array}{c}
32 \times 16 \times 8 \times 4 \times 2 \times 1 \\
32 + 16 + 8 + 4 + 2 + 1 \\
\text{Load No. 4}
\end{array}
\]

**Note:** The same load address cannot be used for Relay Control T/Us, 6A Contact Output T/Us, Dimmer T/Us and any other T/Us.

**Individual Control**

Caution: To avoid non-operation or malfunction, do not set the Dip switches to the positions indicated with “-”. Do not set the Dip switches to Control Patterns.

**Group Control**

**Pattern Control**

**Address setting method for Card Operation switch (8-bit Dip switch)**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
<th>Individual</th>
<th>Group</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>WR3891-8</td>
<td>Card Operation switch</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

**Dip Switch Setting Reference Chart**

**Appellation Indication Unit with T/U, Contact Input T/U for Individual Control (1-Input), Relay Control T/U (1-Circuit) and 6A Contact Output T/U (1-Circuit)**

**Load Channel**

\[
\text{Load Channel} = \text{Load No.} \times 8 = \text{Load Number} \times 8 = \text{Address} \times 8
\]

**Example**

\[
\begin{array}{c}
\text{Load Channel (1-4)} \\
\text{1 + 8 = 9 dh}
\end{array}
\]

**WR391R-8**

Appellation Indication Unit (Red)

**Load No. 4**
Specifications of Wireless Address Setting Unit (WRT9500K-8) — With wireless address setting function.

Features
1. One Wireless programming unit allows address setting and pattern/group control setting.
2. You can perform pattern/group settings and changes at your desk, then later at a FULL-2WAY signal line, transfer the settings and changes to the transmission unit.
3. When setting pattern control, you can set the dimmer level for individual addresses.
4. When setting pattern control, you can set dimmer fade time.
5. You can confirm operation of individual, group, pattern, and dimmer controls, as well as the condition of the system.

Description and Functions
- Displays type of
- Function and
- LCD panel displays

Specifications of Wireless Address Setting Unit (WRT9600-8) — With wireless address setting function.

Features
1. One Wireless programming unit allows address setting and pattern/group control setting.
2. You can perform pattern/group settings and changes at your desk, then later at a FULL-2WAY signal line, transfer the settings and changes to the transmission unit.
3. When setting pattern control, you can set the dimmer level for individual addresses.
4. When setting pattern control, you can set dimmer fade time.
5. You can confirm operation of individual, group, pattern, and dimmer controls, as well as the condition of the system.

Description and Functions
- Displays type of
- Function and
- LCD panel displays

WRT9600-8 Wireless Programming Unit (with Address Setting Function) Rated voltage 8V DC (Four AA batteries not included)

Note: As the LCD panel displays 4 addresses maximum, for pattern/group control setting of many circuits (in excess of 50) we recommend you use a Program Setting Unit (WRT5850-8), or Central Control and Programming Unit (WRT9103K-89) to perform settings.

Specifications of Wireless Address Setting Unit (WRT9500K-8) — With wireless address setting function.

Features
1. One Wireless programming unit allows address setting and pattern/group control setting.
2. You can perform pattern/group settings and changes at your desk, then later at a FULL-2WAY signal line, transfer the settings and changes to the transmission unit.
3. When setting pattern control, you can set the dimmer level for individual addresses.
4. When setting pattern control, you can set dimmer fade time.
5. You can confirm operation of individual, group, pattern, and dimmer controls, as well as the condition of the system.

Description and Functions
- Displays type of
- Function and
- LCD panel displays

WRT9500K-8 Wireless Address Setting Unit Rated voltage 4V DC (Four AA batteries not included)

Note: No program of pattern control or group control range can be set with this Wireless Address Setting Unit. These programs can be set up by a Program Setting Unit (WRT5850-8) on the Master Switch.

Specifications of Wireless Address Setting Unit (WRT9600-8) — With wireless address setting function.

Features
1. One Wireless programming unit allows address setting and pattern/group control setting.
2. You can perform pattern/group settings and changes at your desk, then later at a FULL-2WAY signal line, transfer the settings and changes to the transmission unit.
3. When setting pattern control, you can set the dimmer level for individual addresses.
4. When setting pattern control, you can set dimmer fade time.
5. You can confirm operation of individual, group, pattern, and dimmer controls, as well as the condition of the system.

Description and Functions
- Displays type of
- Function and
- LCD panel displays

WRT9600-8 Wireless Programming Unit (with Address Setting Function) Rated voltage 8V DC (Four AA batteries not included)
Address Setting Method for Infrared I/O Switches and T/Us

Address setting cannot be performed unless the infrared address setting switch and T/U are connected to the FULL-2WAY signal line from the transmission unit.

- **Address setting** — Perform steps 2, 1, and 3 and turn the Wireless programming unit OFF
- **Address change** — Perform steps 1 and 2, Press the cursor key to go to the address you want to change, and change it, and then step 3

Address setting using the Wireless Programming Unit WRT9600-8

**Example: Switch unit (3 switches), FULL-COLOR Model**

**Address confirmation**

1. Turn the WRT9600-8 OFF and press "Address setting".
2. While "   " on the LCD panel display is blinking (within 5 seconds), hold the WRT9600-8 steady, making sure the power switch is in the ON position. If the unit emits a long beep, it is ready to receive the address. If the unit does not emit a long beep, return the address mode to the initial mode and repeat step 2.

**Address input to WRT9600-8**

1. Press the "Address setting" button on the WRT9600-8. (The WRT9600-8 is ready, with the photoreceptor of the unit within 1 cm of the unit is in the ON position.)
2. To enter “G1 Off-delay 5 min.”
   - Press “G” (the first function column)
   - Press “1”
   - Press “Off-delay 5 min."
3. To enter “G2 On-timer 120 min.”
   - Press “G”
   - Press “2”
   - Press “On-timer 120 min.”
4. To enter “G1 Off-delay 5 min.”
   - Press “G”
   - Press “1”
   - Press "Off-delay 5 min."
5. To enter "G1 On-timer 120 min." and "G2 Off-delay 5 min.", press "G1 On-timer 120 min." and the "G2 Off-delay 5 min." keys.
6. While "   " on the LCD panel display is blinking (within 5 seconds), hold the WRT9600-8 steady, and then press the "Address setting" button on the WRT9600-8.
7. Press the "Address setting" button on the WRT9600-8. The LCD panel display turns off.
8. While "   " on the LCD panel display is blinking (within 5 seconds), press the "Address setting" button on the WRT9600-8.

**Address setting**

1. Prepare the Wireless Address Setting Unit (WRT9500-8).
2. Address change
   - Press the "Address setting" key on the WRT9500-8.
   - Press the "Cursor     " key on the WRT9500-8 to move the cursor to the first address, and then press the "Address setting" key.
   - Press the "1", "2", and "3" keys.
3. To change the address
   - Press the "Cursor     " key on the WRT9500-8 to move the cursor to the address you want to change.
   - Press the "Address setting" key on the WRT9500-8.
   - Press the "1", "2", and "3" keys.

Address setting using the Wireless Address Setting Unit WRT9500K-8

**Address confirmation**

1. To enter “Individual 2-1” in the first space:
   - Press “Individual" (P/G setting)
   - Press the "2", "1", and "1" keys.
2. To enter “Individual 2-1” in the second space:
   - Press “Individual" (P/G setting)
   - Press "2", "1", and "1" keys.
3. To enter “Individual 2-1” in the third space:
   - Press “Individual" (P/G setting)
   - Press the "2", "1", and "1" keys.
4. To enter “Individual 2-1” in the fourth space:
   - Press “Individual" (P/G setting)
   - Press the "2", "1", and "1" keys.
5. To enter “Individual 2-1” in the fifth space:
   - Press “Individual" (P/G setting)
   - Press the "2", "1", and "1" keys.
6. To enter “Individual 2-1” in the sixth space:
   - Press “Individual" (P/G setting)
   - Press the "2", "1", and "1" keys.

**Address setting**

1. Press the "Address setting" key on the WRT9500K-8.
2. Address change
   - Press the "Address setting" key on the WRT9500K-8.
   - Press the "Cursor     " key on the WRT9500K-8 to move the cursor to the address you want to change.
   - Press the "Address setting" key on the WRT9500K-8.
   - Press the "1", "2", and "3" keys.
3. To change the address
   - Press the "Cursor     " key on the WRT9500K-8 to move the cursor to the address you want to change.
   - Press the "Address setting" key on the WRT9500K-8.
   - Press the "1", "2", and "3" keys.

Address input to the Wireless Address Setting Unit WRT9500K-8
Group and Pattern Control Program Setting Method 1

Setting with the Selector Switch (with Program Setting Unit)

Group Control Program Setting Method (initial setting)

- Group control program setting: Perform steps 1 to 3
- Group control program confirmation: Perform steps 4 to 6 and 7
- Group control program change: Perform steps 1 to 3, and 7

Prior to group and pattern setting:
(1) Complete the address plan table.
(2) Finish the T/U, switch, and selector switch address settings.

Notes:
- No loads can be controlled during group and pattern setting.

Pattern Control Program Setting Method (initial setting)

- Pattern control program setting: Perform steps 1 to 8
- Pattern control program confirmation: Perform steps 1 to 8 and 9
- Pattern control program change: Perform steps 1 to 8, and 9

Perform steps 1 to 8, and 9 if you are confirming or performing changes.

Notes:
- Pattern control program change:
  - Many ON programs: Press the ON/OFF button, and use the individual switches to change the loads other than those to be ON-programmed to the setting you want.
  - Many OFF programs: Press the ON/OFF button, and use the individual switches to change the loads other than those to be OFF-programmed to the setting you want.

Timer Duration (OFF-delay, ON-timer) Setting Method

(1) Before setting group control, complete timer duration settings (OFF-delay, ON-timer) for the individual switches to which you want to give timer functions using the Wireless Address Setting Unit (WRT5850-8).
(2) In step 1, operate the individual switches for which a timer duration (OFF-delay, ON-time) was programmed. This will illuminate both LEDs (Red and Green).

Both LEDs (Red, Green) OFF .... Override
LED (Green) ON ........................ OFF
LED (Red) ON ........................... ON
(Use the six LEDs as a measure to adjust the level of brightness.)

For dimmer level and timer duration settings, refer to the following.

Dimmer Level Program Setting Method

(1) In step 4, press the dimmer switch ON/OFF switch and ensure the Red LED illuminates.
(2) Set the brightness level with the UP and DOWN buttons.
UP: Brightness level goes up. DOWN: Brightness level goes down.
(Use the six LEDs as a measure to adjust the level of brightness.)

Notes:
- If the Relay Control T/U has a vacant terminal (no relay connected), whose address is set on a switch, exclude that address from the group control range when setting Group Control.
- Do not operate the wireless switches during group program setting.

Notes:
- Pattern control program setting:
  - Many ON settings: Press the ON/OFF button, and use the individual switches to change the loads other than those to be ON-programmed to the setting you want.

Timers Duration (OFF-delay, ON-timer) Setting Method

(1) Before setting pattern control, complete timer duration settings (OFF-delay, ON-timer) for the individual switches to which you want to give timer functions using the Wireless Address Setting Unit (WRT5850-8).
(2) In step 1, operate the individual switches for which a timer duration (OFF-delay, ON-timer) was programmed. This will illuminate both LEDs (Red and Green).

A maximum of 8 ON-timer and OFF-delay circuits can be programmed for 1 pattern.

Notes:
- Pattern control program setting:
  - Many ON programs: Press the ON/OFF button, and use the individual switches to change the loads other than those to be ON-programmed to the setting you want.
  - Many OFF programs: Press the ON/OFF button, and use the individual switches to change the loads other than those to be OFF-programmed to the setting you want.

Notes:
- If the Relay Control T/U has a vacant terminal (no relay connected), whose address is set on a switch, exclude that address from the group control range when setting group control.
- Do not operate the wireless switches during program setting.
**Group and Pattern Control Program Setting Method 2** (Surface Mount Dimmer Switches)

**Group Control Program Setting Method**

- **Group control program setting**: Perform steps 5, 5 and 5.
- **Group control program change**: Perform steps 5, 5 and 5.

Prior to group and pattern program settings:
- On the Surface Mount Dimmer Switches, Master Switches and TUs.

**Master Switches with a Program Setting Unit (WRT9600-9, WRT9600-9-4, WRT9600-15 with WAVAN-4)** are essentially required for program setting of the pattern and group controls.

**Timer Duration (Off-delay or On-timer) Setting Method**

Before setting Group Control Program, complete the timer duration settings (Off-delay or On-timer) on the Wireless Address Switches you wish to have them to have timer duration for using the Wireless Address Switching Setting Method (WRT9600-9).

1. Step 5: both LED’s (Red and Green) lights for the individual switches for which a timer duration (Off-delay or On-timer) was programmed.

- **Pattern control program confirmation**: Perform steps 5, 5, and 5.

**Notes:**
- Up to eight On-timer and Off-delay of individual addresses can be included per group.
- If level of dimmer illumination can be controlled individually under group control.
- If the Relay Control T/U has a vacant terminal to be connected, whose address is set on a switch, exclude that address from the group control range.
- Do not operate the Wireless Switches during group program setting.

**Pattern Control Program Setting Method**

- **Pattern control program**: Perform steps 5, 5, 5 and 5.
- **Pattern control program confirmation**: Perform steps 5, 5 and 5.
- **Pattern program control change**: Perform steps 5, 5 and 5.

**Pattern Control Program Setting Method (initial setting)**

- **Pattern/group control program setting**: Perform steps 5, 5, and 5.
- **Pattern/group control program confirmation**: Perform steps 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, and 5.

**Notes:**
- Do not perform pattern control settings after attempting pattern and group control.

**Setting with the Wireless Programming Unit (WRT9600-8)**

**Group and Pattern Control Program Setting Method 3**

**Group Control Program Setting Method**

- **Group control program setting**: Perform steps 5 and 5.
- **Group control program change**: Perform steps 5 and 5.

Prior to group and pattern program settings:
- On the Wireless Address Switching Setting Unit is open.

**Master Switches with a Program Setting Unit (WRT9600-9, WRT9600-9-4, WRT9600-15 with WAVAN-4)** are essentially required for program setting of the pattern and group controls.

**Notes:**
- To be able to control during group program setting.

**Pattern Control Program Setting Method**

- **Pattern control program**: Perform steps 5, 5, 5, and 5.
- **Pattern control program confirmation**: Perform steps 5, 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, 5, and 5.

**Notes:**
- To be able to control during group program setting.

**Dimmer Level Program Setting Method**

In LCD panel LCD panel LCD panel LCD panel the `Up` and Down Switch as follows:

- Press and hold "Confirm" for more than 2 seconds to input the new "P2" control address for the group address.

**Pattern Control Program Setting Method (initial setting)**

- **Pattern/group control program setting**: Perform steps 5, 5, and 5.
- **Pattern/group control program confirmation**: Perform steps 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, and 5.

**Notes:**
- Do not perform control settings in load addresses that you will not be using.

**Setting the Wireless Programming Unit (WRT9600-8)**

**Group and Pattern Control Program Setting Method 3**

**Group Control Program Setting Method**

- **Group control program setting**: Perform steps 5, 5 and 5.
- **Group control program change**: Perform steps 5, 5 and 5.

Prior to group and pattern program settings:
- On the Program Setting Unit, Master Switches and TUs.

**Master Switches with a Program Setting Unit (WRT9600-9, WRT9600-9-4, WRT9600-15 with WAVAN-4)** are essentially required for program setting of the pattern and group controls.

**Timer Duration Setting (Off-delay, On-timer) Setting Method**

Before setting Group Control Program, complete the timer duration settings (Off-delay and On-timer) for the individual addresses you wish to have them to have timer duration for using the Wireless Address Switching Setting Method (WRT9600-9).

1. Step 5: both LED’s (Red and Green) lights for the individual switches for which a timer duration (Off-delay or On-timer) was programmed.

- **Pattern control program confirmation**: Perform steps 5, 5, and 5.

**Notes:**
- Up to eight On-timer and Off-delay of individual addresses can be included per group.
- If level of dimmer illumination can be controlled individually under group control.
- If the Relay Control T/U has a vacant terminal to be connected, whose address is set on a switch, exclude that address from the group control range.
- Do not operate the Wireless Switches during group program setting.

**Pattern Control Program Setting Method**

- **Pattern control program**: Perform steps 5, 5, 5, and 5.
- **Pattern control program confirmation**: Perform steps 5, 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, 5, and 5.

**Notes:**
- To be able to control during group program setting.

**Dimmer Level Program Setting Method**

In LCD panel LCD panel LCD panel LCD panel the `Up` and Down Switch as follows:

- Press and hold "Confirm" for more than 2 seconds to input the new "P2" control address for the group address.

**Pattern Control Program Setting Method (initial setting)**

- **Pattern/group control program setting**: Perform steps 5, 5, and 5.
- **Pattern/group control program confirmation**: Perform steps 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, and 5.

**Notes:**
- Do not perform control settings in load addresses that you will not be using.

**Setting the Wireless Programming Unit (WRT9600-8)**

**Group and Pattern Control Program Setting Method 3**

**Group Control Program Setting Method**

- **Group control program setting**: Perform steps 5, 5 and 5.
- **Group control program change**: Perform steps 5, 5 and 5.

Prior to group and pattern program settings:
- On the Program Setting Unit, Master Switches and TUs.

**Master Switches with a Program Setting Unit (WRT9600-9, WRT9600-9-4, WRT9600-15 with WAVAN-4)** are essentially required for program setting of the pattern and group controls.

**Timer Duration Setting (Off-delay, On-timer) Setting Method**

Before setting Group Control Program, complete the timer duration settings (Off-delay and On-timer) for the individual addresses you wish to have them to have timer duration for using the Wireless Address Switching Setting Method (WRT9600-9).

1. Step 5: both LED’s (Red and Green) lights for the individual switches for which a timer duration (Off-delay or On-timer) was programmed.

- **Pattern control program confirmation**: Perform steps 5, 5, and 5.

**Notes:**
- Up to eight On-timer and Off-delay of individual addresses can be included per group.
- If level of dimmer illumination can be controlled individually under group control.
- If the Relay Control T/U has a vacant terminal to be connected, whose address is set on a switch, exclude that address from the group control range.
- Do not operate the Wireless Switches during group program setting.

**Pattern Control Program Setting Method**

- **Pattern control program**: Perform steps 5, 5, 5, and 5.
- **Pattern control program confirmation**: Perform steps 5, 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, 5, and 5.

**Notes:**
- To be able to control during group program setting.

**Dimmer Level Program Setting Method**

In LCD panel LCD panel LCD panel LCD panel the `Up` and Down Switch as follows:

- Press and hold "Confirm" for more than 2 seconds to input the new "P2" control address for the group address.

**Pattern Control Program Setting Method (initial setting)**

- **Pattern/group control program setting**: Perform steps 5, 5, and 5.
- **Pattern/group control program confirmation**: Perform steps 5, 5, and 5.
- **Pattern program control change**: Perform steps 5, 5, and 5.

**Notes:**
- Do not perform control settings in load addresses that you will not be using.
Contact Input T/Us

WRT3204-8 Contact Input T/U (4-Input) (Panel Use)

WRT3211-8 Contact Input T/U (1 Input) (Panel Use)

Features

The Contact Input T/U receives a signal (normally open dry contact input) from external devices, enabling individual, group, and pattern control.

Method

Input signal

- ON with contact close
- OFF with contact open

- Turning same loads ON and OFF with a 1 input signal
- ON/OFF operation with a timer
- ON/OFF operation with a Photoelectric EE switch

Control

- Contact close: Changes between set patterns
- Contact open: Indicator light condition does not change

Pattern control

- Turning loads either only ON or only OFF by a timer

Individual control

Set the address of the contact input T/U to match that of the Relay Control T/U or the T/U with 6A, 10A relay to be controlled.

Group control

Set the address of the contact input T/U to match that of the group switch. This will provide the same control as that of the group switch.

Pattern control

Set the address of the contact input T/U to match that of the pattern switch. This will provide the same control as that of the pattern switch.

- The Contact Input T/U operates upon detecting changes in the ON/OFF status of the contact. It only operates when it detects the contact going ON or OFF in individual and group control, or when it detects the contact going ON in pattern control.

- When the contact goes ON or OFF, it is possible to manually control ON/OFF with the override/manual switch.

Contact Input T/U (4-Input) terminal arrangement

Terminal numbers 2, 4, 6, and 8 are connected internally. Do not use terminal numbers 1, 3, 5, and 7 as terminal numbers.

Wiring diagram

See page 62 and 63 for details of the Dimmer Contact Input T/U.

Additional Functions

Application

Method

Control

- Pattern control
- Individual control
- Group control

ON/OFF operation with a timer

Turning ON with an EE switch (photo sensor) and turning OFF with a timer

Notes:

To set pattern or group controls using a contact input T/U, be sure to set the pattern or group with the setting unit in the selector T/U, be sure to set the pattern or group with the setting unit in the selector T/U, be sure to set the pattern or group with the setting unit in the selector T/U, be sure to set the pattern or group with the setting unit in the selector T/U.

Notes:

1) When using the WRT3211-8 (Contact Input T/U (1-input)):
- Do not connect multiple contact input T/Us in parallel for 1-input signal.

2) When connecting to external devices like Timer Setting Unit, install a circuit that disables operation when not required; for example on weekends and holidays.

Note: A voltage signal from the Photoelectric EE Switch is converted to dry contact by HC Relay.
**LCD Appellation Touch Switch**

- **Features**
  1. Double-row size compact switch panel capable of containing up to 24 switches
  2. User-friendly name-touch operation
  3. Finely-divided on/off groups to achieve smart energy-efficient lighting

- **Operation screen (Example)**
  - The names of each switch can be displayed.
  - Available to use the dimmer switches (up to 6 Dimmer switches can be set in total).
  - Available to set the names and address setting on the screen display.
  - Available to set data on your PC by using SD Memory Card.

  ![Wiring diagram](image)

- **Specifications**
  - **Number of pages**: 3 pages
  - **Address setting up to 24 Individual, Group and Pattern switches can be set in total.**
  - **Switch type and address setting range**
  - **Eight-free Switch (infrared I/O)**
    - **Features**
      1. Single-size compact switch panel capable of containing up to eight switches
      2. Simple design to fit in an office space
      3. Finely-divided on/off groups to achieve smart energy-efficient lighting

**Passive Infrared Unit Control**

- **Features**
  1. Controls lighting by detecting changes in temperature when people move.
  2. Equipped with a brightness sensor to enable lighting only when it becomes dark and people are present.
  3. The detection range can be expanded by using auxiliary units.
  4. Can also be operated from a wall switch in combination.
  5. Sensor operation can also be disabled.
  6. Has two addresses, enabling the handling of two loads, such as lighting and ventilation.
  7. Includes wide-angle detection types.

- **Address setting (Example)**
  - **Pattern address setting**
  - **Individual/group address setting**

- **Specifications of WRT3374K-8 and WRT3364K-8**

**Additional Functions**

- **Input signal at 24 V Signal**
  - Approx. 40 lx
  - Approx. 20 lx

- **Power source**
  - 24 V AC

- **Address (Example)**
  - 63-4

- **Switch (for 1 Unit)**
  - WRT3351-8
  - WRT3355-8
  - WRT3365-8
  - WRT3374K-8

**Circuit Design for Passive Infrared Ceiling Unit (Infrared I/O)**

- **Features**
  1. Controls lighting by detecting changes in temperature when people move.
  2. Equipped with a brightness sensor to enable lighting only when it becomes dark and people are present.
  3. The detection range can be expanded by using auxiliary units.
  4. Can also be operated from a wall switch in combination.
  5. Sensor operation can also be disabled.
  6. Has two addresses, enabling the handling of two loads, such as lighting and ventilation.
  7. Includes wide-angle detection types.

- **Address setting (Example)**
  - **Pattern address setting**
  - **Individual/group address setting**

- **Specifications of WRT3374K-8 and WRT3364K-8**

**Lighting OFF Delay Duration**

<table>
<thead>
<tr>
<th>Load 1 (Lighting)</th>
<th>Load 2 (Ventilation Fan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 min</td>
<td>10 sec</td>
</tr>
<tr>
<td>20 min</td>
<td>10 min</td>
</tr>
<tr>
<td>6 min</td>
<td>20 min</td>
</tr>
<tr>
<td>10 min</td>
<td>15 min</td>
</tr>
<tr>
<td>15 min</td>
<td>30 min</td>
</tr>
<tr>
<td>30 min</td>
<td>35 min</td>
</tr>
<tr>
<td>45 min</td>
<td>1 hr</td>
</tr>
<tr>
<td>1 hr</td>
<td>1 hr 30 min</td>
</tr>
<tr>
<td>1 hr 30 min</td>
<td>2 hr</td>
</tr>
<tr>
<td>2 hr</td>
<td>2 hr 30 min</td>
</tr>
<tr>
<td>2 hr 30 min</td>
<td>3 hr</td>
</tr>
<tr>
<td>3 hr</td>
<td>3 hr 30 min</td>
</tr>
<tr>
<td>3 hr 30 min</td>
<td>4 hr</td>
</tr>
<tr>
<td>4 hr</td>
<td>4 hr 30 min</td>
</tr>
<tr>
<td>4 hr 30 min</td>
<td>5 hr</td>
</tr>
<tr>
<td>5 hr</td>
<td>5 hr 30 min</td>
</tr>
<tr>
<td>5 hr 30 min</td>
<td>6 hr</td>
</tr>
<tr>
<td>6 hr</td>
<td>6 hr 30 min</td>
</tr>
<tr>
<td>6 hr 30 min</td>
<td>7 hr</td>
</tr>
</tbody>
</table>

**Lights-OFF Delay Time**

- When performing pattern and group control, be sure to set the pattern/group control content beforehand.
- Details, see P. 45, 50, 52.
Passive Infrared Ceiling Unit (Auxiliary Unit)

**Features**

1. Line-up includes wide-angle detection types.
2. Seven or more auxiliary units can be set up by using the auxiliary extension type. This is suitable for use in spaces such as long corridors.

**Additional Functions**

- When using auxiliary unit with extension function (WRT3367-8)
- When not using auxiliary unit with extension function (WRT3364K-8)

**Detection area**

- Adjust the detection area to 75 cm from the face to enable detection of hand movement.

**Notes**

1. Detection angle can be adjusted by 15° in all directions. The detection area can be narrowed by using a special hood.
2. Max. detection height is 5 m when using the hood.

**Notes (WRT3374K-8, WRT3364K-8, WRT3311-8, WRT3394-8)**

- Detection angle can be adjusted by 15° in all directions. The detection area can be narrowed by using a special hood.
- Max. detection height is 5 m when using the hood.

**Notes (WRT3335-8, WRT3365-8, WRT3367-8, WRT3395-8)**

- Do not connect the FULL-2WAY signal wires and transformer power supply 24V AC wires to the auxiliary unit terminals of the auxiliary unit. This can cause malfunction and lead to accident or injury.

Daylight Sensor Control

**Circuit Design for Daylight Sensor Ceiling Unit**

**Features**

1. Controls lighting by detecting brightness of natural light from outdoors. (Detected illuminance guideline: 100 lx to 2000 lx)
2. Connects directly to FULL-2WAY signal wires.
3. Daylight sensor can be disabled to enable overriding of ON/OFF switching.
4. Can control loads in two ranges, with different illuminances.
5. Enables individual, pattern, group control.
6. Enables control based on illumination at desk top surface.

**Part names and function (with covering plate removed)**

- **Sensor section**
  - Adjustable with an angle of 42° at detectors.
  - The sensor can be rotated to face the direction of incoming light.
  - The sensor can be adjusted by 15° at detectors.
- **Mode select switch**
  - Normal: To turn ON/OFF 5 seconds after reaching the set illuminance value (11% or 95%)
  - Impact: To turn ON/OFF 1 second after reaching the illuminance value (11% or 95%)
  - Tenital: To store memory in memory.
  - Function expansion: 24V AC transformer power supply/remote device setting

**Address and operation**

- **Address setting requires the WRT9500K-8 or WRT5005K-8 setting unit.**

**Safety Precaution**

Daylight Sensor Ceiling Units should only be used for lighting control. Do not use to control non-lighting loads such as electrical equipment, air conditioning equipment, or alarm systems. Doing so may cause malfunction and lead to accident or injury.

**Notes:**

- The illuminance detector in this product is directional. Due to the angle of incidence of incoming light, there may be a difference between the detected illuminance and the value actually measured with a illuminance meter. Furthermore, it is designed to detect sunlight, so the detected illuminance will change if it is affected by fluorescent or incandescent lights.
- To determine the illuminance at which detection actually occurs, adjust the illuminance setting control of the product and check at the point where the ON/OFF LED switches on.
- To control using the desktop surface as the standard:
  - The illuminance correlation is stored in memory if the illuminance of the setting surface exceeds 400 lx.
### Example of using Daylight Sensor Ceiling Unit

**Wiring diagram**

**Wiring when outdoor light is bright, and lights up 100% when dark.**

1. **When bright P1**
   - 2nd row lights up at 70%
   - 1st row lights up at 30%

2. **When dark P2**
   - Lights up at 100%

**Additional Functions**

- **Remote Control Transformer** (WR3400-8)
- **Dimmer control** (WR3655-8)
- **Power supply terminal** (WR5554-8)
- **Breaker**
- **DC**
- **Ballast, 0-10V**

**Outline of operation** (When it is based on 500lx)

- Press the "MODE" button three times to move the cursor ((push and hold the button for more than 10 minutes, all settings after pressing the "SET" button last will not be stored).
- Press the "SET" button to fix the data.
- Press the "MODE" button twice to align the "~" mark.
- Press the "BACK" key to display the same number as the sensor address that was set in
- Press the "PRG" key to display the "PRG No." with "~" or "~" continuously.
- When "500 lx" is set, the system does not operate correctly because the non-operating area exceeds the highest limit of detectable illuminance level of 9990 lx.
- Also, the system does not operate correctly when "9090 lx to 9990 lx" is set because the non-operating area exceeds the highest limit of detectable illuminance level of 9990 lx.
- The "PRG No." blinks.

**Features**

1. The sensor detects the outside light brightness to control interior lighting. Unnecessary lighting can be avoided while it is light outside. (Rough guide for illuminance setting: 60 lx to 9080 lx)
2. You can set the illuminance from the illuminance/address setting unit installed on the wall of a control room.
3. Installation in a high ceiling of a station platform, factory, warehouse, etc. is recommended.

**Recommended cases**

- **Factories**
- **Warehouses**

### Daylight Sensor Control

**Daylight Sensor Ceiling Unit (with Separate Setting Unit)**

**Features**

1. The sensor detects the outside light brightness to control interior lighting. Unnecessary lighting can be avoided while it is light outside. (Rough guide for illuminance setting: 60 lx to 9080 lx)
2. You can set the illuminance from the illuminance/address setting unit installed on the wall of a control room.
3. Installation in a high ceiling of a station platform, factory, warehouse, etc. is recommended.

**Outline of operation** (When it is based on 500lx)

- Press the "MODE" button three times to move the cursor. (push and hold the button for more than 10 minutes, all settings after pressing the "SET" button last will not be stored.)
- Press the "SET" button to fix the data.
- Press the "MODE" button twice to align the "~" mark.
- Press the "BACK" key to display the same number as the sensor address that was set in
- Press the "PRG" key to display the "PRG No." with "~" or "~" continuously.
- When "50 lx" is set, the system does not operate correctly because the non-operating area exceeds the highest limit of detectable illuminance level of 9990 lx.

**Names and Functions**

- **Setting Sensor Address**
  - To set the sensor address.
- **Setting Illuminance**
  - To set the illuminance.
- **Setting Time**
  - To set the time.
- **Setting Mode**
  - To select the mode.
- **Setting PRG No.**
  - To select the program.
- **Setting Ship**
  - To select the ship.
- **Setting Back**
  - To return to the former setting.
- **Setting Set**
  - To fix the settings.
- **Setting PRG**
  - To increase or decrease the value.

**Wiring diagram**

**FULL-WAY signal wire**

- For dimmer signal
- For manual dimming
- For load ON/OFF
- For daylight sensor ON/OFF (non-operation)
Wireless Control

Circuit Design for Wireless Control

• Receivers should not be mounted in any location subject to direct sunlight.

Design tips for circuit divisions

(1) A Wireless receiver, and a Wireless switch can be added to the basic circuit to permit wireless control.

(2) For pattern and group control, set the address of the Wireless switch to that of pattern or group switches on the selector switch.

(See page 61 for address setting method.)

Be sure to perform pattern and group control settings. See pages 49 to 52 for details.

Wiring diagram (using 2 dimmer circuits, 1 group dimmer, and 1 dimmer contact input)

Wireless Address Setting Unit can be used for address setting.

Features

(1) Allows handling of a large number of dimmer circuits.

Uses (individual) load addresses.

(2) Can perform group dimming. Can control the collective dimmer circuits using (individual) load addresses with onedimmer switch.

(3) Allows connection of dimmer control to other systems. Possible by connecting non-voltage a-contact signal to the dimmer contact input T/U.

Notes on dimmer control of incandescent lamps

(1) The minimum load capacity of dimmer circuits is 40W, and the maximum power is 2000W per lamp. (Multiple lamps can be connected within the rated capacity.)

(2) Avoid operation of lighting fixtures with voltage-dimintransformers (low-voltage lighting).

(3) The dimmer unit with T/U is for regular 220V AC incandescent lamps only. Do not use with special-function lighting fixtures (e.g. incandescent lamps with built-in dimmer functions) or fluorescent lamps.

(4) When joining 2 or more dimmer circuits, keep the load capacity at 80% or less in order to prevent overheating. WRT4415-81 (1500W) or less WRT4415-82 (2500W) or less WRT4415-83 (3500W) or less WRT4415-84 (4500W) or less WRT4415-85 (5500W) or less WRT4415-86 (6500W) or less Furthermore, when installing multiple units of the WRT4415-86, ensure at least the minimum mounting space between them as shown in the diagram on the right.

(5) The maximum number of circuits that can be controlled is 256, including individual control. Grouped with the addresses of other relay control T/U, 6A contact output T/U is not possible.

Since pattern and group control takes longer with the greater number of dimmer circuits, it is recommended to limit the number of circuits to 64.

(6) Either individual addresses (1 to 64) or dimmer addresses (1 to 16) may be used. However, the group dim and fade functions will not work if dimmer addresses are used. Using individual addresses is therefore recommended.

Refer to page 48 for instructions on making address settings.

(7) In order to use an individual address for a group control T/U, the dimmer circuit is always selected with the T/U equipped dimmer unit, set the selector switch on the front of the unit to the WRT7200-82 position. To use a dimmer address, set the selector switch to the WRT7200-82 position.

(8) Set the address for the dimmer switch/dimmer contact input (WRT2040-82) both 'brightness adjustment' and 'ON/ OFF.' It is also possible to set 'brightness adjustment' and 'ONOFF' to different addresses.

Notes on installing a Dimmer Unit (for incandescent lamps)

The Dimmer Unit generates anemous electrical noise from phase control.

ADJUST WITH THE INPUT VOLUME. When using the Dimmer Unit to dimming incandescent lamps, there may be noise on radios or other audio devices.

Internal circuit diagram

Note

When using high-frequency fluorescent lamps, install the wireless receiver at least 1.5 meters away from lighting fixtures.
Dimmer Control for Dimmable Ballast (0-10V DC Type)

Features
(1) Enables control of the continuous dimming of Dimmer Ballast (0-10 V DC Type).
(2) Enables step-free brightness adjustment to suit the situation from a local switch.
(3) Enables the handling of a large number of dimming circuits: Uses individual addresses. (Circuits used for inverter dimming control) = (256 circuits) - (Circuits used for individual control) - (Circuits used for incandescent lamps dimming control)
(4) Enables group dimming. Dimming circuits using load (individual) addresses can be controlled as a group using a single dimming switch. Be sure to perform group control content setting. For details, see P.52.
(5) Enables connection of dimmer control to other systems. Possible by connecting non-voltage a-contact signal to the dimmer contact input T/U.

Example of use in a corridor
Realizes energy conservation in spaces such as corridors, with no loss of harmony, by using dimming rather than thinned-out lighting.
Switch is used for lighting at 100% during the day, and 50% at night.
Turns lights off late at night after everyone leaves.

Precautions
(1) This equipment is especially designed for a load consisting of 0-10V DC fluorescent continuous dimming type lighting fixtures. Please inquire with us directly to determine if use is possible or not.
(2) Wiring distance between the dimmer unit and lighting fixtures lamps is 100m max. Wiring distance between the dimmer unit and remote control transformer is 25m max.
(3) Use 0.9mm or 1.2mm solid copper wire (CPEV wire, etc.) for dimmer signal lines.
(4) The number of controlled circuits is 256max., including individual control and incandescent lamp continuous dimming control.
(5) Both individual addresses (dimmer 1 to 16) can be used, but group dimming and fade control cannot be used with dimmer addresses, so we recommend using individual addresses.
(6) When using a dimmer unit address with an individual address, switch the selection switch on the back of the fixture to "WRT2050 series." When using with a dimmer address, switch to "WRT2000-82."
(7) Set to both "Brightness Adjustment" and "ON/OFF" for the address of a dimmer switch/dimmer contact input T/U. Addresses of "Brightness Adjustment" and "ON/OFF" can be set to other addresses.
(8) A dimmer contact input T/U cannot be set to a dimmer address (dimmer 1-16). Individual or group addresses should be set.
(9) When the "ON/OFF switch" is turned off, the level is automatically set to minimum.
Central Control and Programming Unit

Basic Setting Method (Continued)

Pattern/Group Control Setting Input (From Transmission Unit)

Pattern/Group Control Setting Input (From Transmission Unit)

Inputs pattern/group control settings in this unit to a transmission unit.

1. Set to the transmission unit to which is connected.

2. Using 

3. Select the input method, and press 

4. Input the address to be edited by using the numeric keypad or and .

You can continue editing, press .

To cancel input while it is in progress, press .

Input will be canceled after input of the current address is finished.

Additional Functions

Notes:

(1) To ensure correct input/output of setting content, do not perform switch operation using the FULL-2WAY system when outputting from this unit to a transmission unit, or when inputting to this unit.

(2) If all pattern and group addresses have been set, to input to this unit or to output from this unit to a transmission unit will take a maximum of approx. 30 minutes.

(3) The setting content, or the setting content input from a transmission unit to this unit, is not erased even if the power supply is turned off.

(4) Setting content is input or output for all 256 circuits, even if T/U for all channels have not been connected to the FULL-2WAY system.
**Circuit Design for Simplified Appellation Indication System**

**Features**
1. ON/OFF display example with appellation indication unit (dip switch).
2. Reduces wiring by using only the FULL-2WAY signal line feed wire to flash ON and OFF.
3. Indication unit cover can be removed for the writing of names of items under control.
4. Can have relay (load) ON state display using switch operation.

**Wiring diagram**

Use WRT3900R-8 Appellation Indication Unit

For designation display without Relay control T/U with the same load address

Use a WRT3901R-8 Appellation Indication Unit with T/U

---

**Motor-Driven Control**

**Circuit Design for Controlling Motor Driven Electrical Equipment**

**Motor Drive T/U specifications** (2 Types of motor drive T/Us: stop terminal N.O. and stop terminal N.C.)

<table>
<thead>
<tr>
<th>Terminal number and name</th>
<th>WRT4421-8, WRT4421-84 (stop terminal N.O. type)</th>
<th>WRT4422-8, WRT4422-84 (stop terminal N.C. type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Open output terminal</td>
<td>Normally open 1 pulse (1.2 ± 0.2 sec.)</td>
<td>Normally open 1 pulse (1.2 ± 0.2 sec.)</td>
</tr>
<tr>
<td>(2) Common terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Stop output terminal</td>
<td>Normally open 1 pulse (1.2 ± 0.2 sec.)</td>
<td>Normally close 1 pulse (0.2 sec.)</td>
</tr>
<tr>
<td>(4) Close output terminal</td>
<td>Normally open 1 pulse (0.2 sec.)</td>
<td>Normally open 1 pulse (0.2 sec.)</td>
</tr>
<tr>
<td>(5) Monitor input terminal</td>
<td>Motor-driven equipment monitor output</td>
<td>Motor-driven equipment side monitor output</td>
</tr>
<tr>
<td>(6) Monitor output terminal</td>
<td>Motor-driven equipment monitor output</td>
<td>No-voltage contact, or 10 - 30V DC 18 - 30V AC 10mA max.</td>
</tr>
<tr>
<td>(7) Monitor input terminal</td>
<td>Switch Green LED illuminates Green when monitor circuit is ON</td>
<td>Switch Red LED illuminates when monitor circuit is OFF</td>
</tr>
</tbody>
</table>

**Basic wiring diagram**

**Notes**

1. Neither a Relay control T/U nor a 6A contact output T/U should be used at the same load address as a Appellation indication unit with a T/U function (WRT3901R-8). In such an application use a WRT3900R-8 Appellation Indication Unit. (See page 44 for details on address setting.)
2. To have multiple indicators at the same load address when using a Appellation indication unit with T/U function, use a WRT3900R-8 Appellation Indication Unit for the second location and beyond.

---

**Circuit Design for Card Operation Switch (Dip switch)**

**Wiring diagram**

Can control lights in each room of a hotel, for example, and automatically turn lights OFF when nobody is in.

**Design tips for circuit division**

1. Match the card operation switch address.
   - For group control (Pattern control not possible) Match the addresses for the selector switch "group control" switch and the card operation switch. (See page 44 for details on address setting.)
   - For individual control Match the addresses of the relay control T/U and the card operation switch. (See page 44 for details on address setting.)

**Notes**

1. Use a card specifically intended for an electronic key card reader. (Card not included.)
2. Do not use magnetized cards such as telephone cards, nor transparent or metallic cards.
**Additional Functions**

**Circuit Design for Program Timer Unit (Astronomical Clock Type)**

- **Features**
  - (1) Enables lighting control using a timer set to correspond to a schedule
    - Enables timer-based lighting control (in one minute units) using a maximum of 30 programs.
  - (2) Enables operation according to an annual schedule
    - Enables settings that repeat every year (month X, day Y; X-day of Yth week of month 2), or setting of a date up to 13 months in advance (1 time only).
  - (3) Equipped with a solar timer function to determine sunrise and sunset
    - Enables tasks such as exterior lighting control to be done using the solar timer, with the sunrise and sunset times for 12 regions throughout the country stored in memory.
  - (4) Holidays (special days) can be set or canceled from FULL-2WAY switches
    - Special day 1, Special day 2 and timer setting/canceling can be done from a FULL-2WAY switch by setting the address in the timer unit.
  - (5) Model for direct connection with FULL-2WAY signals
    - Contact input T/U and timer functions are integrated into a single unit, and the timer has been miniaturized, so relay control panel space can be conserved. For the setting method, see P. 71.

- **Notes**
  - (1) To operate the same address twice in one day, set by changing the program number (1 to 30)
    - (Example) Program no. 1: G1 8:00 to 12:00
    - Program no. 2: G2 13:00 to 17:00
  - (2) If two or more astronomical clock type program timer units are installed, and control is performed at the same time with different units, a discrepancy will arise in the controlled time by the amount of difference between the current time of each unit.
  - (3) Automatic correction can be done by making one unit a master, and synchronizing with the master unit every hour, on the hour.
  - (4) When using the solar function, setting is done with a region stored in memory.
    - If using this function, you can control contact input and switch operation by giving priority to enable input settings, such as those from the selector switch.
  - (5) More than 1 sec.

- **Wiring diagram**

**Example of Using a Program Timer Unit**

- **Example of control of common area and exterior lights using the Program Timer Unit**

  - **Features**
    - Common area lights are automatically lit from 8:00 to 21:00 on weekdays and turned off on holidays.
    - Exterior lights are automatically lit in the evening and turned off at 23:00 on both weekdays and holidays.
    - When employees work on holidays, common area lights are automatically turned on by switch operation in the manager’s office the previous day.

  - **Control range**
    - Individual: 0-1 to 63-4
    - Group: 1 to 127

  - **Specifications**
    - Number of programs: 30
    - Applicable transmission units: WRT2050-80, WRT2040 series, WRT2000 series

  - **Control Settings**
    - Special 1
      - Holiday set/cancel switch
      - More than 1 sec.

  - **Power Source**
    - Program: AC 220V

  - **Example of control of common area and exterior lights using the Program Timer Unit**

  - **Features**
    - Common area lights are automatically lit from 8:00 to 21:00 on weekdays and turned off on holidays.
    - Exterior lights are automatically lit in the evening and turned off at 23:00 on both weekdays and holidays.
    - When employees work on holidays, common area lights are automatically turned on by switch operation in the manager’s office the previous day.

  - **Control range**
    - Individual: 0-1 to 63-4
    - Group: 1 to 127

  - **Specifications**
    - Number of programs: 30
    - Applicable transmission units: WRT2050-80, WRT2040 series, WRT2000 series

  - **Control Settings**
    - Special 1
      - Holiday set/cancel switch
      - More than 1 sec.

  - **Power Source**
    - Program: AC 220V
Program Timer Unit (WRT3540K-8) Setting Method

### Names and Functions

#### Identifying Control Features

- **Power indicator light**
- **Mode key**
- **Address No.**
- **Load type**
- **Auto Off ON/OFF**
- **Load status**
- **Control mode**
- **Operation type**
- **D.S.T**
- **Key functions**
- **Norm (Normal)**
- **SP-D**
- **SP-D2**
- **STBY**
- **AUTO OFF**
- **LOCAL**
- **Daylight Saving**
- **CLR**

#### LCD Panel

- **Address No.**
- **Load type**
- **Auto Off ON/OFF**
- **Load status**
- **Control mode**
- **Operation type**
- **D.S.T**
- **Key functions**
- **Norm (Normal)**
- **SP-D**
- **SP-D2**
- **STBY**
- **AUTO OFF**
- **LOCAL**
- **Daylight Saving**
- **CLR**

### Before Use — About Modes

Select the appropriate Mode before setting the clock or the program.

#### Timer Modes and Their Functions

The pointer "↑" or "↓" in the top or bottom area of the LCD display indicates which timer mode has been selected.

**The timer mode changes each time the SET key is pressed.**

- **NML (Normal)**
- **PRG** (Program)
- **SP-D** (Special Day)
- **STBY** (Standby)
- **AUTO OFF**
- **LOCAL**

**About Mode Selection**

- **NML (Normal)**: Set the present time and date. The unit defaults to this mode when it is turned on for the first time.
- **PRG** (Program): Program the unit, modify existing programming, or verify programming just entered.
- **SP-D** (Special Day): Program special days (holidays).
- **STBY** (Standby): The unit is in standby mode.
- **AUTO OFF**
- **LOCAL**

### Basic Operating Steps

1. **Move the pointer "↑" to the PRG (Program) position with the SET key.**
2. **Assign a program number to the program you are setting.**
   - The allowable range of PRG No. (Program No.) is 1 to 30.
   - Select with the SET key.
3. **Verify the control program.**
   - Select a program number if a program is already assigned to that number.
   - The contents will be displayed 2 seconds later.
4. **Set the present time.**
   - Set the time digits with the SET key.
   - Set the minute digits with the SET key.
5. **Select Operation type.**
   - Select NML (Normal) with the SET key.
6. **Set On Time.**
   - Set the hour digits with the SET key.
   - Set the minute digits with the SET key.
7. **Select Off Time.**
   - Set the hour digits with the SET key.
   - Set the minute digits with the SET key.
8. **Select Days of Week to Enable Timer.**
   - Mark the special day(s) or day(s) of week with the pointer "↑" or "↓" on which the timer is to be enabled.
9. **To set another stage, repeat the above procedure from step 1.**
10. **When finished, move the pointer "↑" back to the NML (Normal) position with the SET key.**

**The timer will not function correctly unless the Normal mode is selected.**

### Error Display

<table>
<thead>
<tr>
<th>Error Display</th>
<th>Error description</th>
<th>Inspection</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>FULL 2WAY signal lines connected?</td>
<td>Connect the FULL 2WAY signal lines.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FULL 2WAY signal lines shorted to each other</td>
<td>Check the FULL 2WAY signal lines.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission Unit power turned On</td>
<td>Turn the transmission Unit Power Off.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output of amplifier shorted?</td>
<td>Check the Output wires of amplifier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformer fuse burned out?</td>
<td>Replace Transformer fuse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No FULL-2WAY signal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is Output of amplifier shorted?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are Sync. output terminals shorted together?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Error related to FULL 2WAY system**

- **No FULL-2WAY signal**
- **Uncontrollable**
- **No synchronization output**

**Error related to time (set time) not set**

- **No synchronization output**
- **Are Sync. output terminals shorted together?**
- **Are Sync. output terminals shorted together?**
Installation

Notes on Installation

1. Panasonic products are not compatible with other companies’ remote control systems. Do not combine our products with systems from other companies. Use only Panasonic remote control relays, circuit breakers, and transformers.

2. For multiplex transmission signal wire, use only that made especially for FULL-2WAY remote control.

3. Cautions for wiring
   - Although general purpose electrical wire can be used, it is recommended that communication cable (CPEV) be used for signal lines to differentiate them from power lines and prevent their mis-wiring.
   - Avoid wiring signal and power lines in parallel. This may damage system components or cause those connected to signal lines to malfunction. If such parallel wiring is unavoidable, keep both wires at least 30 cm apart, or house them in separate conduit pipes.
   - Avoid connecting types of electric wire to the screw terminals (signal terminals, etc.). (Doing so could cause electric wires to become detached.) If this type of connection is unavoidable, use pressure terminals instead.

4. When using the All-ON setting switch for setting the pattern control program
   - If there is a terminal not connected to a relay (in the case of 3 or fewer relays connected) in the relay control T/U (4-Circuit), the type of connection is unavoidable, use pressure terminals instead.

5. If there is a terminal not connected to a relay (in the case of 3 or fewer relays connected) in the relay control T/U (4-Circuit), the type of connection is unavoidable, use pressure terminals instead.

6. Apply grounding to the Transmission unit, amplifier, signal line monitor T/U, and Computer Interface Unit.

7. Avoid the following connections to Transmission units, amplifiers.
   - Connecting signal wires from multiplex transmission units or amplifiers to each other;
   - Connecting a signal wire from a transmission unit to an output signal wire from an amplifier;

8. Do not connect inappropriate types of electric wire to the screw terminals (signal terminals, etc.). (Doing so could cause electric wires to become detached.) If this type of connection is unavoidable, use pressure terminals instead.

9. Keep the power circuits for products requiring a 10A HID Relay or the 6A Contact Output T/U Unit.

10. FULL-2WAY type remote control products (except 20A HID relays) installed in distribution panels should be kept at least 10cm away from wires carrying a current of 15A or above.

11. When a WN3700-8 FULL-COLOR Metal Mounting Strap, install the WN3710-8 on the left side of the WN3700-8 as shown in the diagram.

12. Signal line short-circuit indication
   - Transmission Units and Amplifiers have signal line short-circuit indication LEDs. These LEDs light up when the signal line is short-circuited. Momentary flashing indicates the signal line is normal. Any short-circuit occurring in a signal line between multiplexers is indicated by an LED continuing to flash in the nearest amplifier. (See diagram.)

13. Be sure to contact a mega test on wiring after disconnecting a power line to the system components (including a Transmission Unit and an Amplifier, etc.). Never attempt any mega testing for signal lines.

14. To set addresses for switches and T/Us, connect them to a FULL-2WAY signal wire from a Transmission Unit and use a Wireless Address Setting Unit (WR9600-8 or WR97900K-8).

15. Remove the cover from the switch (Infrared I/O) and use a pencil to write the load addresses. Use a name plate less than 0.3mm thick.

Notes on Design

1. Because of its incompatibility with other manufacturers’ remote lighting control systems, this system cannot be used in combination with any other system.

2. For Infrared I/O Switches and Terminal Units, be sure to use WRT2050 series or WRT2040 series Transmission Unit.
   - Do switch fixtures can also be connected to WRT2000 series Transmission Unit.

3. Transformer Capacity
   - Power supply to all the 20A HID Relays can be provided by one Transformer per Transmission Unit.
   - A Transmission Unit sequentially controls Relay Control T/Us, which simultaneously operate four 20A HID Relays, at intervals of 15sec. (Under the pattern control, group control, etc.) The momentary current consumption of National relay is 3.5A x 4 pcs., and the transformer capacity is 1.5A. Therefore, up to four 20A HID Relays are controlled by a Transformer per transmission unit.
   - For easier wiring, it is recommended that a Transformer be installed to each relay control panel.
   - When a Transformer capacity exceeds 1.5A, such as when using Contact Input T/U’s, be sure to add another Transformer to the system.
Troubleshooting

Load (lights) do not work even when a switch is pressed (when using the WRT2040 series or WRT2000 series or WRT2050 series Transmission Units)

**Before Operation LED Status**
- Press once
- Green ON

**Check1** Check the status of the operated switch LED.

**Check2** Check the indicator lamp LED on the programmer setting switch.

**Check3** Check the status of the indicator LEDs of the Transmission Unit and Amplifier.

**Troubleshooting**

1. **Troubleshooting**
   - There may be a transmission unit malfunction. Replace the transmission unit.
   - Signal current consumption is too high. Install an amplifier in the system to limit the current to less than 500mA.
   - There is a short-circuit in the FULL-2WAY signal wire. Find and fix it.
   - There is a discontinuity in the FULL-2WAY signal wire due to a disconnected wire or loose terminal screw. Find and fix it.
   - Check supply power and voltage to the transmission unit.
   - Set an address in the switch. (For the address setting method, see P.44.)
   - There are several T/Us set to the same address. Assign only one address per T/U.
   - There is no T/U corresponding to the load address of an individual switch. (This applies when using the WRT2000 series.)
   - Pattern and group control contents have not been set for pattern/group switches. (Enter the primary power for the remote control transformer and store pattern/group control settings.)
   - There is a T/U corresponding to the load address of an individual switch. (This applies when using the WRT2000 series and WRT2050 series.)
   - Check supply power and voltage to the remote control transformer.
   - The life of the transmission unit has expired. Replace the transmission unit.
   - The remote control relay is malfunctioning, and the state of the main contact will not switch from ON to OFF. Replace the remote control relay. (The contact may be fused. Check the load capacity.)
   - Wire connections in the operation circuit of the remote control relay are reversed. Find and fix the fault.
   - When the switch is pressed, the LED switches normally between Red and Green, but the load does not go ON.
   - When LED is Green, Load is ON. Replace the transmission unit.

2. **Troubleshooting**
   - There is no power supply circuit.
   - The load fixtures are faulty. Check for a burnt out lamp, etc.
   - There is a problem with the system. Contact our company.
   - When the switch is pressed, the LED switches normally between Red and Green, but the load does not go ON.
   - The FULL-2WAY signal wire has been connected to the input/output terminals of the amplifier in the opposite order. Reconnect them correctly.

3. **Troubleshooting**
   - The remote control relay is malfunctioning, and the state of the main contact will not switch from OFF to ON. Replace the remote control relay.

**Other Problems with Relay Control T/Us**

1. The wire of a relay control T/U has come into contact with the blue terminal of a remote control relay due to a wire whisker, etc.
2. High voltage (115V or 230V AC) is being applied to a relay control T/U.
<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>WN9020-8</td>
<td>Black Chip</td>
<td>34</td>
</tr>
<tr>
<td>WN9101-4</td>
<td>Insulated Mounting Strap</td>
<td>24</td>
</tr>
<tr>
<td>WN9350-9</td>
<td>FULL-COLOR Modular Plates Applicable to Switches (Silver)</td>
<td>36</td>
</tr>
<tr>
<td>WN9350-10</td>
<td>FULL-COLOR Modular Plates Applicable to Switches (Aluminum)</td>
<td>36</td>
</tr>
<tr>
<td>WN9350-11</td>
<td>FULL-COLOR Modular Plates Applicable to Switches (Stainless Steel)</td>
<td>36</td>
</tr>
</tbody>
</table>

**WR**

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>W8T8439-4</td>
<td>9A Contact Output T/U (Single Pole)(Panel Use)</td>
<td>22,27</td>
</tr>
<tr>
<td>W8T8439-5</td>
<td>9A Contact Output T/U (Single Pole)(Panel Use)</td>
<td>22,27</td>
</tr>
<tr>
<td>W8T8440-6</td>
<td>9A Contact Output T/U (Single Pole)(Panel Use)</td>
<td>22,27</td>
</tr>
<tr>
<td>W8T8440-7</td>
<td>9A Contact Output T/U (Single Pole)(Panel Use)</td>
<td>22,27</td>
</tr>
</tbody>
</table>

**WTC**

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>W7C31016-8</td>
<td>COSMO Module Plates Applicable to Switches (Silver) (4-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C31026-8</td>
<td>COSMO Module Plates Applicable to Switches (Silver) (2-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C31046-8</td>
<td>COSMO Module Plates Applicable to Switches (Silver) (6-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C31056-8</td>
<td>COSMO Module Plates Applicable to Switches (Aluminum) (4-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C32016-8</td>
<td>COSMO Module Plates Applicable to Switches (Aluminum) (8-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C32026-8</td>
<td>COSMO Module Plates Applicable to Switches (Aluminum) (6-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C32036-8</td>
<td>COSMO Module Plates Applicable to Switches (Aluminum) (4-Gang)</td>
<td>35</td>
</tr>
<tr>
<td>W7C32046-8</td>
<td>COSMO Module Plates Applicable to Switches (Aluminum) (2-Gang)</td>
<td>35</td>
</tr>
</tbody>
</table>

**WTF**

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>W7P31115-8</td>
<td>Decorative Plates</td>
<td>35</td>
</tr>
<tr>
<td>W7P31125-8</td>
<td>Decorative Plates</td>
<td>35</td>
</tr>
<tr>
<td>W7P31130-8</td>
<td>Decorative Plates</td>
<td>35</td>
</tr>
<tr>
<td>W7P31170-8</td>
<td>Insulated Mounting Strap</td>
<td>COSMO Module)</td>
</tr>
</tbody>
</table>

**EE**

<table>
<thead>
<tr>
<th>Product No.</th>
<th>Product Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E8B1-202-8</td>
<td>Photocell ED Switch</td>
<td>54</td>
</tr>
</tbody>
</table>
### SELECTING CHART of AVAILABLE PRODUCTS for EACH MARKET

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Model Number</th>
<th>Available in U.S.A</th>
<th>Available in Asia</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switches (COSMO Module)</td>
<td>WRT5601-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Master Switches</td>
<td>WRT6001-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>LCD Appulative Touch Switch</td>
<td>WRT8001-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Switches (Eight Free Module)</td>
<td>WRT5602-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>LCD Appulative Touch Switch</td>
<td>WRT8002-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Switches (FULL-COLOR Module)</td>
<td>WRT5603-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>LCD Appulative Touch Switch</td>
<td>WRT8003-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Switches (GLACIER Series)</td>
<td>WRT5604-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>LCD Appulative Touch Switch</td>
<td>WRT8004-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Central Control and Programming Unit</td>
<td>WRT5605-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Transmission Units</td>
<td>WRT5606-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Amplifiers</td>
<td>WRT5607-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Transmitters</td>
<td>WRT5608-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>20A HID Relays</td>
<td>WRT5609-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>10A Contact Output TUs (Panel Use)(Infrared I/O)</td>
<td>WRT5610-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6A Contact Output TUs (Panel Use)(DIP switch)</td>
<td>WRT5611-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>6A Contact Output TUs (Panel Use)(DIP switch)</td>
<td>WRT5612-8</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

- ✓: Available
- •: Available but not recommended for sale in USA.
- Non-UL: Not recommended but available. Please contact our sales companies for details.
- UL-Approved: Approved by UL.
- Non-UL: UL approval required, but NOT Approved. It CANNOT be available for sale in USA.