

# Industrial radio remote control systems with infrared startup link (optional, JAY électronique patent)

# UJ series

CE

## Typical applications

- ◆ Overhead traveling cranes
- ◆ Gantry cranes, tower cranes, lifting equipment
- ◆ Maintenance cradles
- ◆ Industrial equipment
- ◆ Building industry and civil engineering equipment



## Modular radio remote control with patented safety concept

JAY électronique's new UJ radio remote control system is designed to meet the most stringent safety and reliability requirements of today's users, setting the pace for tomorrow's EEC standards.

### Reinforced safety by redundant circuits

All functions are continuously monitored by comprehensive redundancy of the command reception circuits designed using two independent micro-processors. The sophisticated priority shutdown system used with the UJ remote control ensures a level of reliability surpassing most systems available today. The priority shutdown system combines active and passive priority shutdown technology by respectively generating a shutdown command and stopping transmission by means of two guided contact relays.

### Transmitter and receiver matched up visually or automatically

The experienced operator controlling a travelling crane (or machine) starts up the system by applying a precise command procedure. When the «on» button is pressed, the operator immediately identifies the crane operated by a horn which sounds, backed up by a

rotary flashing light which stays on so long as the crane is operated.

Each transmitter-receiver set operates with a specific, unique code. This ensures the one transmitter / one crane safety principle.

At sites with a large number of cranes and operators, the «Infrared Return» feature requires the operator to point to the crane which he wishes to start up. Since the IR link requires an obstacle-free line of sight, the transmitter and crane are matched up with no possibility for human error.

Once the crane has been pointed to and successfully matched up using the IR link, the operator is free to use his radio remote control system with all the safety, productivity and quality features which this type of system provides.

### Increased resistance to shocks

Through its extensive experience (15000 sites equipped with JAY radio remote control systems), JAY électronique is constantly in touch with the most rigorous industry requirements.

The UJ unit's «one-hand» ergonomic design also provides high shock resistance through the use of shock-absorbing protectors, significantly increasing service life in rough-service environments. The remote control is fitted at each end with heavy-duty shock absorbers ensuring optimum protection if the unit is dropped

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- Radio approvals:
  - Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, The Netherlands, Norway, Sweden, UK
  - Approvals in process in other countries
  - Our systems meet European Directives requirements relative to:
    - Machines
    - \* Conformity certificate from AIB-VINÇOTTE (Belgium). Safety stop category 4 nb B96-002-998-A
    - \* BG (Germany) certificate n° 94057
    - Electromagnetic compatibility CE type examination certificate nb CR 96-5011 to CR 96-5014 Emitech
    - Low voltage
    - CSA approval nb LR 101751-1



**JAY**  
électronique

The UJ is an industrial radio remote control system specially designed for overhead travelling cranes, tower cranes and gantry cranes, in accordance with the most recent EEC Machine Directive 89/392 covering remote control systems.

**UJ system features:**  
**radio remote control**

- ◆ freedom of movement
- ◆ easy to use
- ◆ precision control

**infrared startup link (optional)**

- ◆ line-of-sight startup, eliminating risk of human error in identifying crane to be operated.

**modular design,**

By its modular design, the reception system components can be positioned to ensure optimum system efficiency.

The UJ system is the result of JAY's lengthy experience in radio remote-controlled cranes and equipments. Among other features, the UJ system is designed to adapt to a broad range of site configurations.

**1/1 Flexible open-ended system**

Sites implementing a large number of remote controls require a large number of frequencies. The JAY 400 MHz UJ product line features:

- 12 frequencies in 458 MHz, 64 frequencies in 433 MHz.
- transmitter power of 1 mW.

This combination ensures high transmission quality and transmitter power control while avoiding unnecessary radio space congestion.

**Frequency configurable at worksite.**

As your needs evolve, or during the commissioning procedure, the transmitter frequency can be reprogrammed to adapt the UJ system to your new conditions. The frequency can be reconfigured by a maintenance technician experienced in electronic circuits.(\*).

(\*) : on BG versions, the code and the frequency can't be modified by the user

**1/2 Configurations**

**UJE + UJA + UJD**

Example: control of an overhead travelling crane in an open-space workshop. This configuration responds to the high concern for operational safety.

**UJE + (1 or 2 or 3) UJF + UJA +UJD**

Example: control of an overhead travelling crane on a site (such as a workshop), comprising a number of cranes with all cranes available to all personnel. False and unintentional manoeuvres are avoided by the fool-proof infrared startup link. This configuration is designed to respond to safety hazards which can exist despite a qualified personnel having a thorough understanding of the worksite, by ensuring that the operator is in clear line-of-sight with the crane to be controlled.

**1/3 Starting up a system**

◆ **Standard UJ**

The system is started up by turning the keyswitch (n° 455 in standard, contact us for other numbers) at the bottom of the UJE transmitter. The operator then unlocks a red priority general shutdown palmswitch and presses the "on" pushbutton to couple the UJE to the crane or to a device to be controlled.

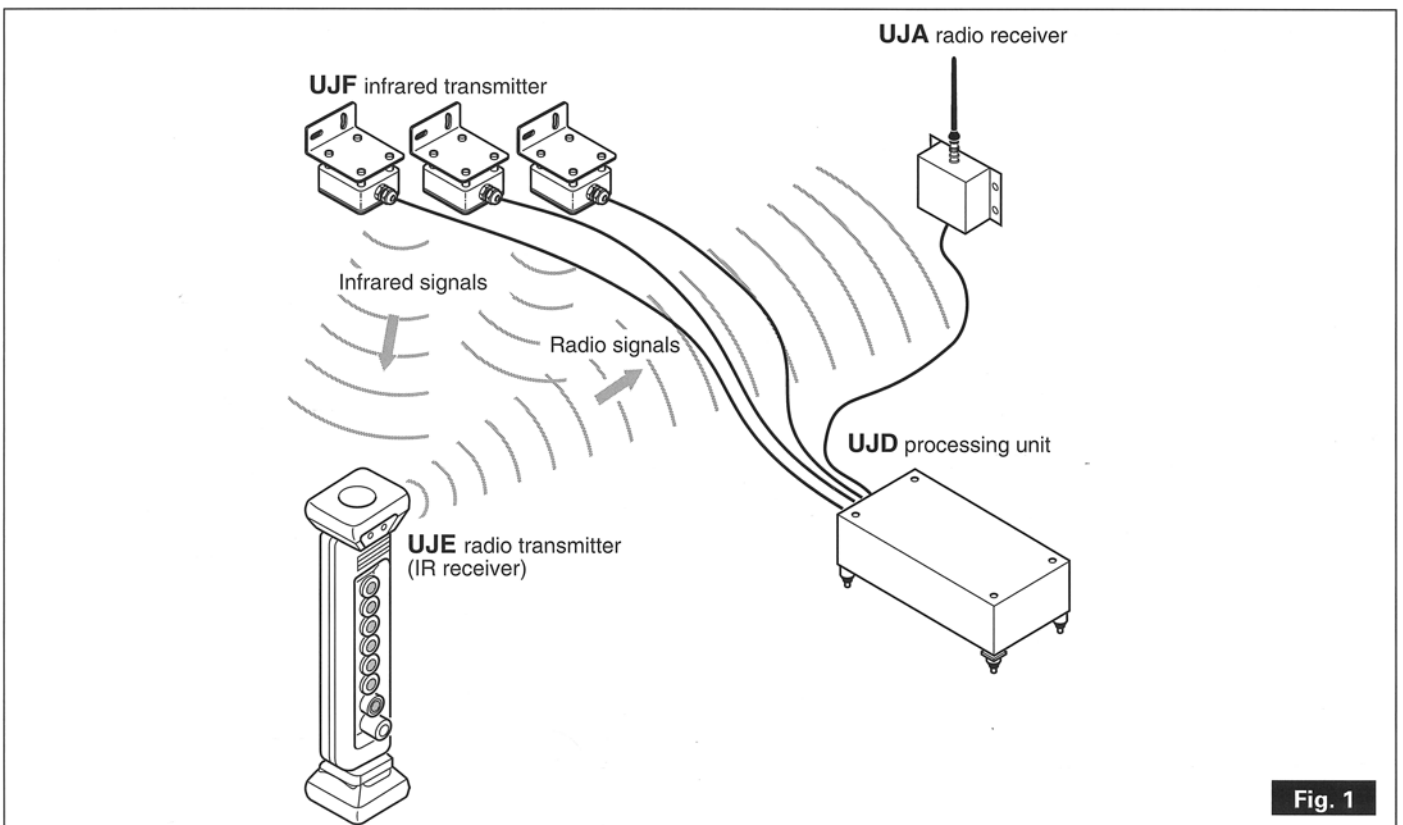
**Note:** Each UJD processing unit supplied is configured with a single, specific code to ensure that a given transmitter is only coupled with the crane or equipment to be controlled provided the basic safety practices are observed.

◆ **UJ with infrared startup link**

In addition to the standard startup procedure described above, the line-of-sight startup procedure consists in pointing the UJE transmitter at one of the UJF infrared transmitters mounted under the crane. These are only activated when the UJE requests startup by a radio coded message.

The UJF infrared transmitters then generate a "specific key" to the UJE transmitter enabling startup of the radio control function when the "On" pushbutton is pressed.

Once the radio link is established (UJE - UJD), the UJF infrared transmitters stop transmitting. The operator is then free to move about as may be required using his radio link to control the crane.



**Fig. 1**

## 2/1 Transmission

- ◆ Each transmitter-receiver assembly is individually coded.
- ◆ Commands are received by 2 processing circuits working separately and comparing their results.

## 2/2 Circuits

- ◆ Output relay states monitored (system wrapped-around by re-reading of relay states).
- ◆ The two reception processing circuits control 2 safety relays (RS1 and RS2) with linked and guided contacts.
- ◆ Safety relays (RS1 and RS2) controlled by electronic safety circuits (same self-check principle used with light curtains).
- ◆ Each of the two safety relays:
  - monitors the common line of the output relays (series-connected contacts)
  - generates a priority general shutdown (\*) contact which is independent and voltage-free (see wiring diagram on page 9).

## 2/3 Operation

- ◆ **Active priority general shutdown (\*)**: An active command is instantaneously generated when the emergency shutdown palmswitch is pressed. This command is confirmed (ensuring command redundancy) by cutout of the transmitter power supply. The transmitter stops transmitting, resulting in turn, in confirmation of the shutdown command by the receiver (passive shutdown). With each of these commands (active and passive), the receiver de-energizes the series-connected control and safety relays (operation inhibit redundancy).

- ◆ **Passive priority general shutdown (\*)**: should no signal be received for more than 2 s (for example, due to cutoff of transmission), the safety and output relays are de-energized to shut down the system.

- ◆ **"Dead man" feature**: this function shuts down the receiver when no command has been received after 4 minutes (contact us for other time delay). In the 4 minutes which follow, if no button has been pressed or no other command has been generated, a new startup procedure must be performed to enable the generation of new commands.

**Note**: on the 12-button transmitters, the last 4 buttons have no effect on the "Dead man" feature. In certain cases, it may be useful to actuate one of the first 7 buttons ("On" button for example).

- ◆ **Protection against power supply cut-outs** of less than 1 second at the processor unit.

## 2/4 Equipment protection

- ◆ By fuse on common line contacts.
- ◆ By fuse series-connected with each of the safety contacts.

### (\*) Note.

The "Priority General Shutdown" designation comes from the "Normal Shutdown" terminology of the EEC Machines Directive. The usual term used in the Industry is "Emergency Shutdown". Within the scope of the Machines Directive, an "Emergency Shutdown" device is not required when the same function is ensured by a "Normal Shutdown" device.

# Operating guidelines

## Getting the most from your system

### 3/1 Safety relay (see page 9)

The redundant safety principle should be applied as far as possible in the priority general shutdown wiring. Though a single circuit can be used (by series-connecting RS1 and RS2), we recommend backing up the priority general shutdown circuit (\*) up to the power relays to achieve the optimum system safety configuration (RS1 and RS2) used as separate redundant circuits).

### 3/2 Command circuit wiring

At the UJD outputs, the commands controlling movements in opposite directions (up - down, for example) can be used either as independent contacts (example: terminals 1 and 3), or as interlocked outputs (example: terminals 2 and 4). We recommend the interlocked outputs. The independent outputs are reserved for applications other than lifting. The installation and commissioning engineer should however check the possible usefulness of simultaneously implementing interlocked outputs. When inhibiting counter-acting commands in a context where the safety factor or the value of the transported loads is high, regardless of the type of output implemented, two interlocking contactors should be used in the power relay circuits.

### 3/3 - Choice of frequencies

The UJ product line is available with 12 frequencies in 458 MHz and 64 frequencies in 433 MHz (see list on page 11). The frequency can be reconfigured on the worksite. For sites with several cranes, different frequencies must be used for each crane. For sites with more cranes or equipments than the number of available frequencies, be sure not to use the same frequency for two receivers located within 500 meters of each other.

### 3/4 - Installation of antennas

The simplest rule consists in installing antennas perpendicular to metal surfaces and as far away as possible from these surfaces.

### 3/5 Installation of receiver system

The modular UJ system is designed so that each component can be located to ensure highest system efficiency. As a general rule, we recommend installing the UJD processing unit as close as possible to the control cabinet, with the UJA receiver unit in an unobstructed location within a 10 m radius (interconnect cable supplied). The UJF infrared transmitter modules (standard 10 meter cables supplied) should be placed to ensure unobstructed coverage of the desired startup zones (see figure 2).

### 3/6 - General rules when using the UJ systems

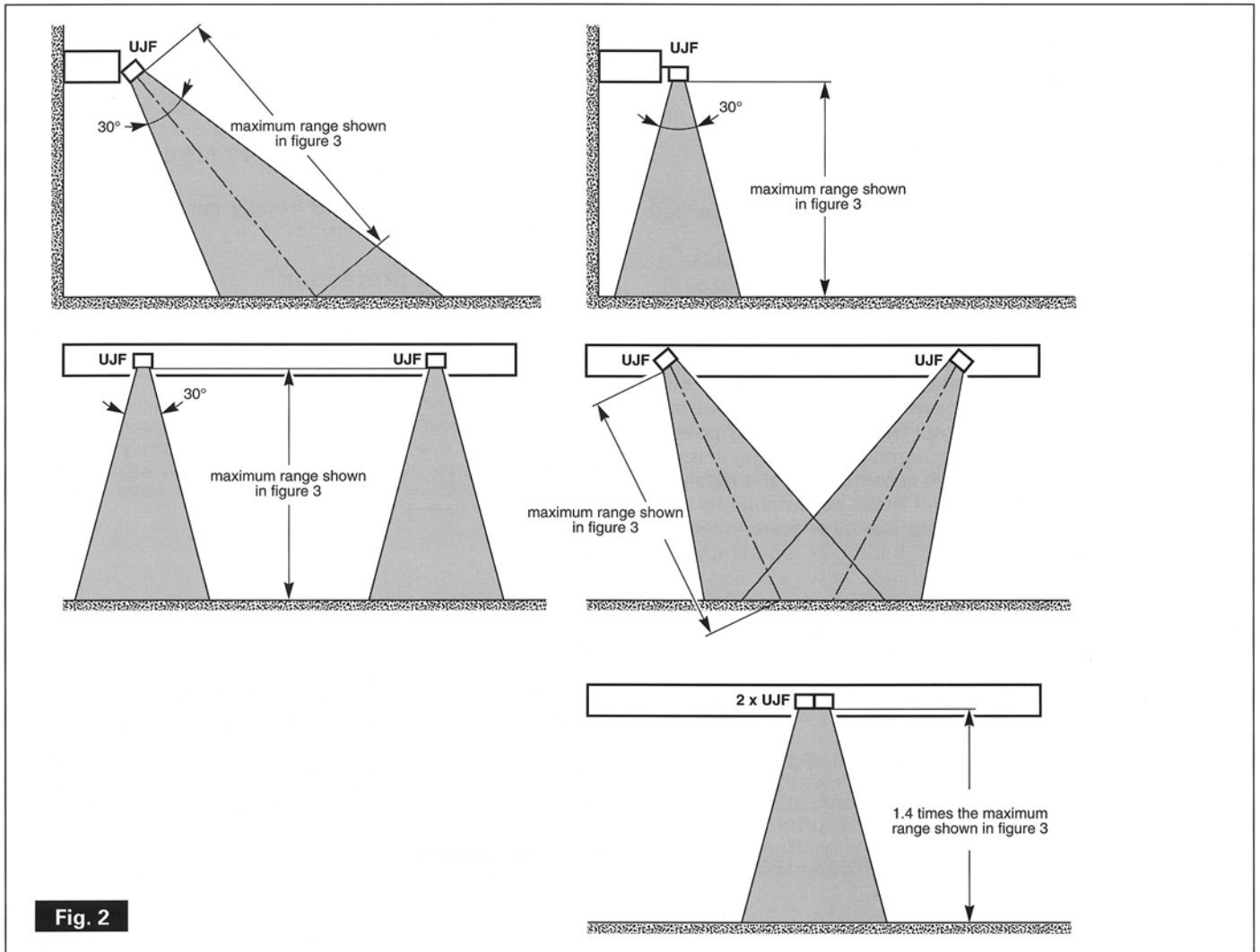
#### Refer to the applicable rules:

- ◆ **Electromagnetic Compatibility**: The UJ systems are designed to comply with all EMC Directives and applicable requirements in this area.
- ◆ The user must eliminate interference at the source. For this purpose, each remote control is supplied with a set of 3 capacitors (for example, to eliminate interference on the sliding contacts of travelling cranes).
- ◆ The coils of relays and contactors in the control panel should be fitted with interference suppression devices (per EMC Directives).
- ◆ Concerning the Low Voltage Directive, ensure the grounding lines are properly connected when the system is stopped or in motion.
- ◆ Concerning the EEC Machines Directive, in addition to ensuring that users have been properly trained in the safety rules and practices, ensure that:
  - startup of a lifting device is always indicated by an audible signal (horn or buzzer) or a light signal (rotary flashing lights),
  - the direction panel supplied with each unit is properly aligned and visible under the crane. The panel is used to identify the direction of movement controlled from wherever the operator is standing by means of a set of colored arrows matching the colors of the pushbuttons.

## Positioning the IR transmitters

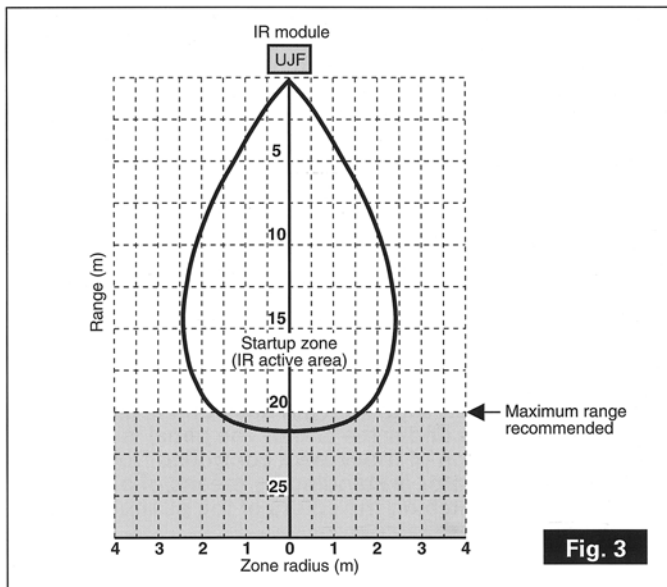
Two transmitters are supplied in standard. For certain system configurations, only one or 3 transmitters are required (see reference on page 12 to order a third IR transmitter). The startup zone perimeter can be defined using 1 or 2 or 3 transmitters.

### Examples



**Fig. 2**

## Startup zone (IR-active area)



**Fig. 3**

## 5/1 UJD processing unit (10 channels with 8-button transmitter, 16 channels with 12-button transmitter)

Physical characteristics and environmental ratings		
Housing, protection rating	Aluminum, IP65	
Fastening system	By 4 insulating antivibration mounts secured by M8 screws	
Connection with equipment	<ul style="list-style-type: none"> <li>◆ For Faston lugs, 6.35 mm</li> <li>◆ Cable entry: 2 cable glands PG29 / CM24 for 18 to 25 mm dia. cables (outputs) PG7/CM6 for 3 to 6 mm dia. cables (power supply)</li> </ul>	
Connection with other UJ components	<ul style="list-style-type: none"> <li>◆ Receiver connection: 50 Ohm BNC connector</li> <li>◆ IR module links: spring-locking terminals</li> </ul>	
Weight	6 kg	
Operating temperature range	- 20 to + 50 °C	
Storage temperature:	- 40° C to + 85° C	
Electrical characteristics		
Power supply	Voltage	<ul style="list-style-type: none"> <li>◆ 24, 48, 110, 230 VAC ± 20 %</li> <li>◆ 24 V DC ± 20 %</li> </ul>
	Power consumption	<ul style="list-style-type: none"> <li>◆ Receiver on standby: 9 VA</li> <li>◆ Receiver in operation: 16 VA max.</li> </ul>
Outputs	Control	<ul style="list-style-type: none"> <li>◆ 10 relays (8-button transmitter) or 16 relays (12-button transmitters) with 2 NO contacts and common line cut-off via a safety relay</li> <li>The common line can be separated by 4 independent commons (see schematic Fig.5 page 9)</li> </ul> <p><b>Relay characteristics</b></p> <ul style="list-style-type: none"> <li>- maximum current: make 20 A / hold 5 / break 5 A max.</li> <li>- acceptable voltage: 750 VAC max ,</li> <li>- maximum breaking power: 100 W / 1000 VA,</li> <li>- service life: 0,1 A - 10 V DC : 2.10<sup>8</sup> operating cycles,</li> <li>- service life: 4 A - 250 V AC : 10<sup>6</sup> operating cycles.</li> </ul>
	Response time	<ul style="list-style-type: none"> <li>◆ Channels 1 to 16: 100 ms average</li> <li>◆ Priority general shutdown: 150 ms average</li> </ul>
	Safety	<ul style="list-style-type: none"> <li>◆ 2 safety relays RS1 and RS2 with linked, guided contacts</li> <li>- contacts series-connected with common line of control contacts.</li> <li>- voltage-free contacts for system priority shutdown.</li> </ul>
LED indicators	<ul style="list-style-type: none"> <li>◆ 1 status indicator light for each output relay.</li> <li>◆ 1 green "power on" indicator light</li> <li>◆ 1 yellow "SELFTEST" indicator light (startup enabled)</li> <li>◆ 1 red "radio link established" indicator light</li> </ul>	
Protection	Power supply	2 fuses
	Contact common line	1 5A fuse
	Control contacts	275 V overvoltage peak clippers
	Safety contacts	5 A fuses



## 5/2 UJE transmitters (8 and 12-button units)

Physical characteristics and environmental ratings	
Housing	<ul style="list-style-type: none"> <li>◆ Yellow polypropylene, through-colored</li> <li>◆ Foam shock absorbers at housing ends</li> <li>◆ IP 65</li> <li>◆ Shoulder strap</li> </ul>
Buttons	<ul style="list-style-type: none"> <li>◆ Average service life: 1 million operating cycles</li> <li>◆ 8 and 12-button versions</li> </ul>
Operating temperature range	- 20°C to + 50°C
Storage temperature	- 30 °C to + 70 °C
Battery charging temperature range	0 to 50 °C
Ambient light conditions (IR startup option)	20 000 lux
Weight	8-button unit: 1.6 kg - 12-button unit: 2.1 kg
Functional characteristics	
	<ul style="list-style-type: none"> <li>◆ 6 functions, each controlled by a two-level pushbutton (low/high speed)</li> <li>◆ 1 "On" pushbutton</li> <li>◆ 1 "Priority general shutdown" locking palmswitch</li> <li>◆ 1 "On/Off" keyswitch</li> </ul>
Electrical and radio characteristics	
Power supply	Ni-Cad battery
Self-contained operation	◆ 8 hours with continuous transmission
Transmitter module	Frequency synthesis technology - programmable by DIL-switches
Transmitter power	1 mW (operated under French license)
Average range	50 m in unobstructed space (1)
Transmitter frequency	UHF (see list of frequencies on page 11)

(1) Range may vary according to prevailing environmental conditions to which the transmitter and receiver antenna may be subject (frameworks, metal partitions, etc.)

### 12-button transmitters

With the 12-button version, 6 additional channels are available. The first 8 pushbuttons are similar to those of the standard model.

The additional 4 buttons are supplied, on request, either as momentary pushbuttons or as rotary switches providing a number of combinations (see table below).

**Unless otherwise specified, the unit is supplied equipped with 4 pushbuttons.**

#### 12-button transmitter references:

Associate the button code to its physical position

9 10 11 12 ← physical position, button no.

UJE . . . . / x x x x ← button code (0 to 9)

Button code	Button type	Possible locations
0	Blanking cap	9 to 12
1	BLACK pushbutton	0 to 12
2	YELLOW pushbutton	0 to 12
3	RED pushbuttons	0 to 12
4	Keyless locking EMERGENCY SHUTDOWN palmswitch	12
5	Rotary switch with 2 fixed positions	9 to 12
6	Rotary switch with 3 fixed positions	10 and 11
7	Rotary switch with 2 fixed positions + 458A key	9 to 12
8	Rotary switch with 3 fixed positions + 458A key	10 and 11
9	Rotary switch with 3 automatic return positions	10 and 11

### Cross-reference between UJD processing unit relays and UJE transmitter buttons.

◆ buttons 1 to 8: see next page

◆ buttons 9 to 12: the table below matches the relay positions with the pushbutton positions (factory configuration). Relay operation can be reversed by changing the jumper positions.

**Note :** In compliance with the EEC Machines Directive, fixed-position rotary switches cannot be used to control movements representing a safety hazard.

button	UJD	2-position rotary switch		3-position rotary switch				
		OFF	ON	1	2	3		
9	"+" 11	0	1	1	0	-	-	-
10	"+" 12	0	1	1	0	0	0	1
	"+" 13	0	1	1	0	1	0	0
11	"+" 14	0	1	1	0	0	0	1
	"+" 15	0	1	1	0	1	0	0
12	"+" 16	0	1	1	0	-	-	-

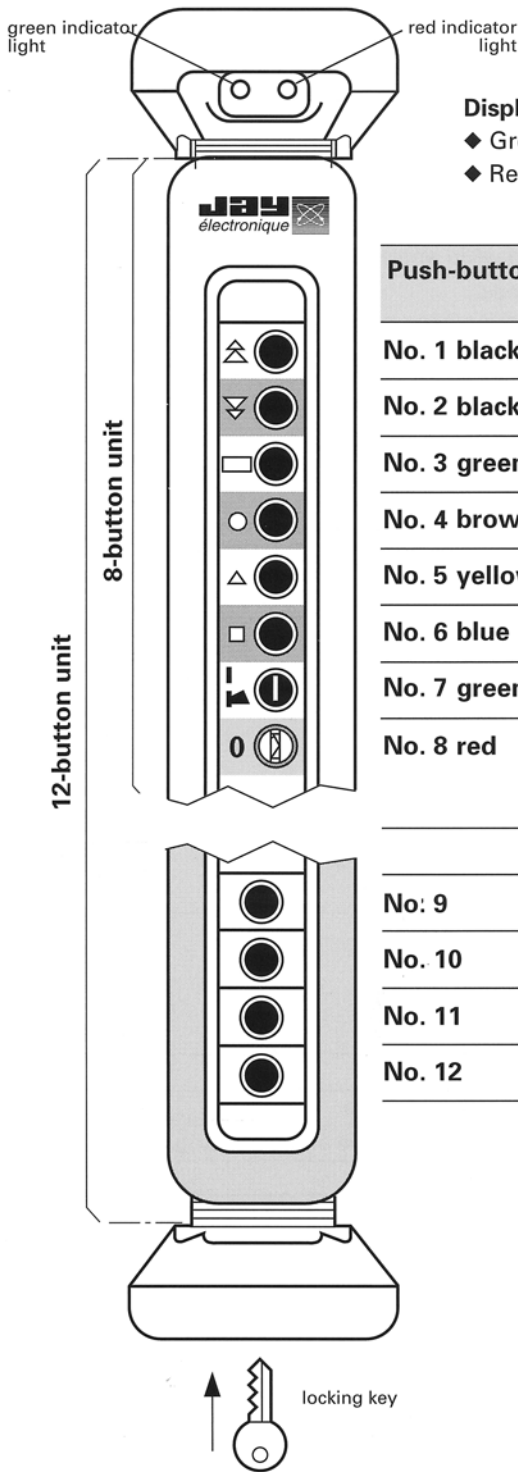
1 : relay energized  
0 : relay de-energized  
+, - : jumper position (supplied in + position)

Ex. :

10	"+" 12	0	1	1	0	0	0	1
	"-" 13	1	0	0	1	0	1	1

# Transmitter functions

The table below indicates the Functions of each pushbutton with the unit powered up.



### Display:

- ◆ Green indicator light: on / transmitting
- ◆ Red indicator light: IR receptio + battery alarm

### Audible warning signal (buzzer)

- ◆ Standby for operation
- ◆ Battery alarm
- ◆ "Dead man" function

Push-buttons	Function	Active position	Speed	UJD relay
No. 1 black	Up	1	Low (UP-LS)	Relay 1
		2	High (UP-HS)	Relays 1 and 3
No. 2 black	Down	1	Low (DN-LS)	Relay 2
		2	High (DN-HS)	Relays 2 and 3
No. 3 green		1	Low (TR-LS)	Relay 4
		2	High (TR-HS)	Relays 4 and 6
No. 4 brown	Cross-travel left	1	Low (TL-LS)	Relay 5
		2	High (TL-HS)	Relays 5 and 6
No. 5 yellow	Long-travel forward	1	Low (TF-LS)	Relay 7
		2	High (TF-HS)	Relays 7 and 9
No. 6 blue	Long-travel backward	1	Low (TB-LS)	Relay 8
		2	High (TB-HS)	Relays 8 and 9
No. 7 green	On + horn	pressed in		Relay 10
No. 8 red	◆ switching on.....button out enabled ◆ priority general shutdown.....pressed in			Relay 17
No. 9				Relay 11
No. 10				Relays 12 and 13
No. 11				Relays 14 and 15
No. 12				Relay 16

**Buttons 9 to 12 on the transmitter have no effect on the "Dead man" function (see section 2/3).**

Fig. 2

**Note:** To facilitate identification of travel and translation controls, a direction panel with coloured arrows matching the colours of the transmitter's pushbuttons is supplied with the unit (flexible adhesive panel (40 x 40 cm) placed under crane).

**Starting the transmitter:**  
 After turning the key, release pushbutton No. 8 (priority general shutdown).  
 The safety relay 17 will only be energized after pressing the "On" pushbutton (No. 7) once the green indicator light has come on.

### 5/3 UJA receiver

UJA: Single-antenna receiver (supplied with 1 antenna)

<b>Protection rating</b>	IP 65
<b>Housing</b>	Aluminum, supplied with 3 antivibration mounts
<b>Weight</b>	UJA = 0.7 kg
<b>Fastening system</b>	By 3 M5 screws
<b>Power supply</b>	By processing unit via coaxial cable
<b>Operating temperature range</b>	- 20° C to + 50° C
<b>Storage temperature</b>	- 40° C to + 85° C
<b>Antenna connector and processing unit link</b>	50 Ohm BNC
<b>Antenna</b>	Flexible sheathed whip antenna
<b>Tuner</b>	Frequency synthesis See available frequencies on page 11
<b>Frequency</b>	Programmable by DIL-switches
<b>Sensitivity</b>	Better than 1 µV

### 5/4 Antenna and coaxial cable

A 10m coaxial cable is supplied for connection of the receiver to the processing unit

### 5/5 UJF infrared modules

These modules are connected to the UJD processing unit. The 10 m interconnect cable is supplied with the unit. This length can be extended to 20 m using a shielded cable supplied as an option).

◆ 2 modules are supplied with the IR option. For certain configurations, only one module or a third module (to order separately) is necessary.

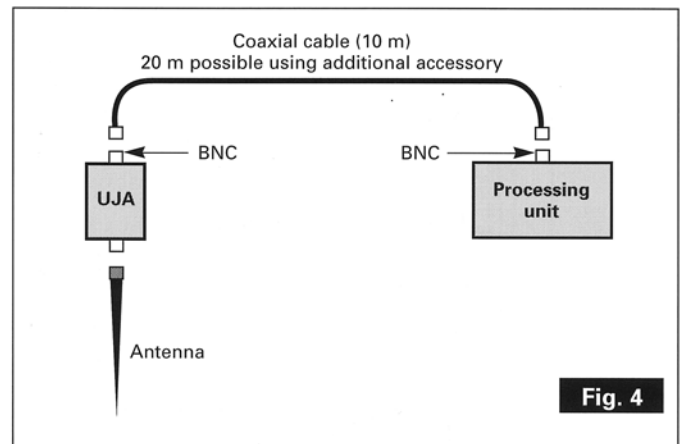


Fig. 4

<b>Protection rating</b>	IP 65
<b>Housing</b>	Aluminum + polycarbonate lens
<b>Weight</b>	1 module = 0.7 kg (with 10m cable and mounting bracket)
<b>Fastening system</b>	Directionally adjustable bracket
<b>Operating temperature range</b>	- 20° C to + 50° C
<b>Storage temperature</b>	- 40° C to + 85° C

### 5/6 UJC charging unit

	standard charger	fast charger
<b>charging time</b>	< 16 h	< 1 h
<b>Protection rating</b>	IP 52	IP 52
<b>Weight</b>	2.9 kg	3.6 kg
<b>Fastening system</b>	see page 10	see page 10
<b>Power supply</b>	110 V AC, 230 V AC (standard) tolerance: +/- 20% Class 2 - Double insulation <input type="checkbox"/>	110 V AC, 230 V AC tolerance: +/- 20% Class 2 - Double insulation <input type="checkbox"/>
<b>Power consumption</b>	3.5 VA (AC) - 100 mA (DC)	11 VA max
<b>Operating temperature range</b>	0° C to + 50° C	+ 10° C to + 40° C
<b>Storage temperature</b>	- 40° C to + 85° C	- 30° C to + 80° C



## Power supply

2 of the system units must be connected to an external power source:

- ◆ UJF processing unit (UJA and UJF units power supplied by UJD).
- ◆ Charging unit for UJC transmitter. The charging unit is connected to a 230 VAC (standard - class 2) source with double insulation (not requiring connection to ground). The system is supplied with a 2 m cable fitted with a standard 2-pole mains supply plug connector. UJD processing units, with serial number over..., offer the possibility to separate the common line in 4 independant commons groups. In order to separate the common lines the links A1-A2, B1-B2, C1-C2, must be removed.

## Grounding

Only the UJD requires connection to ground:

- ◆ The circuits are grounded by terminal 40.
- ◆ The housing is grounded by a grounding braid connected across one of the insulating antivibration mounts.

### UJD wiring diagram

The information plate inside the unit contains all the information you will need for UJD wiring.

### Example wiring diagram for use with a travelling crane.

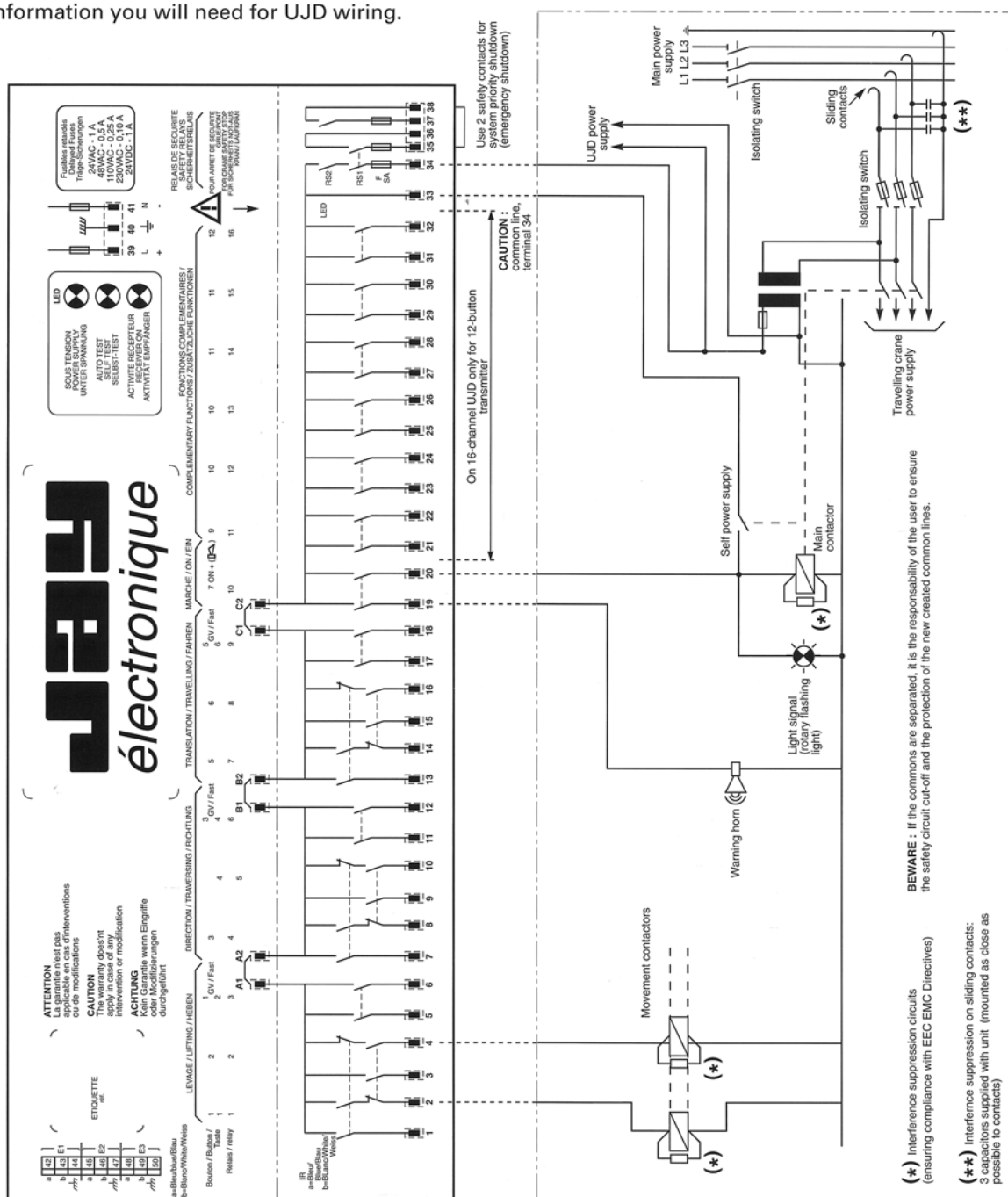
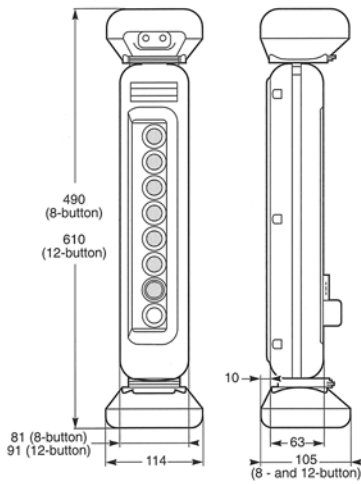
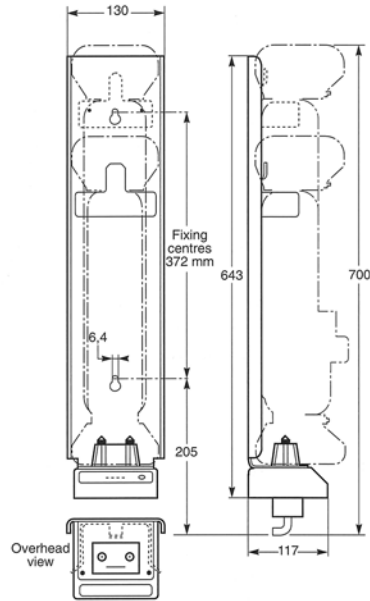


Fig. 5

## 7/1 UJE transmitter

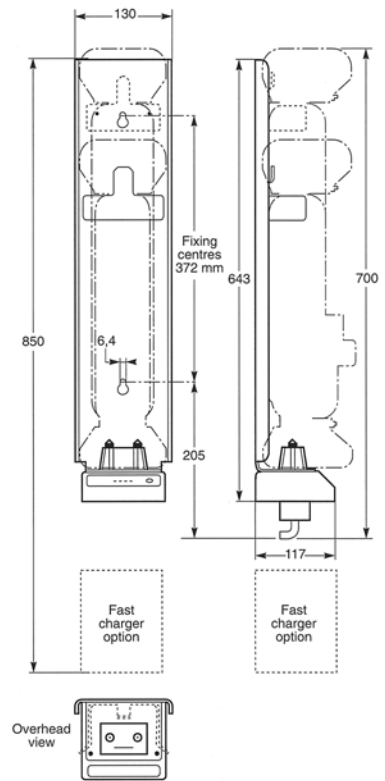


## 7/2 Wall-mounted standard UJC00 charging unit

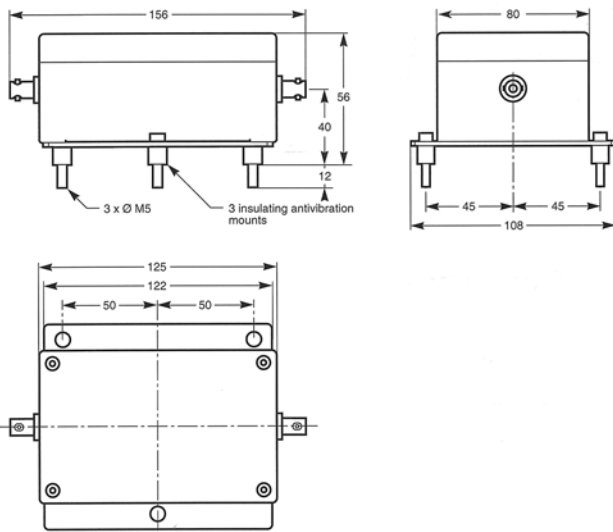


## 7/3 Wall-mounted UJC0S fast charger

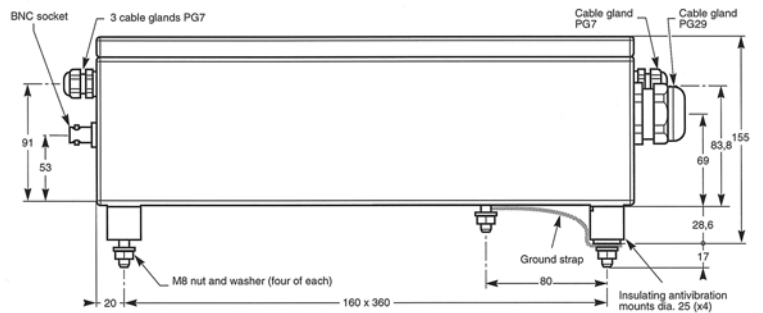
A mounting template is supplied with the charger



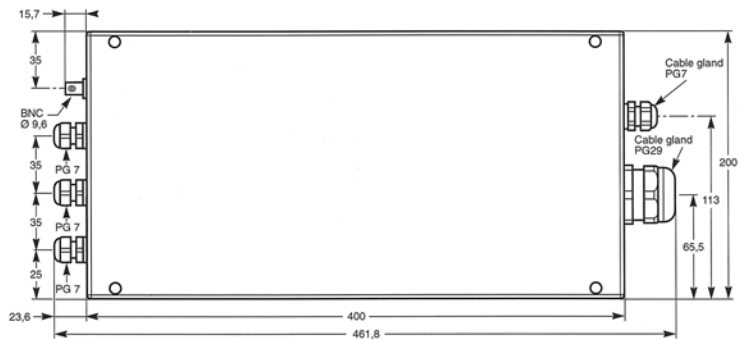
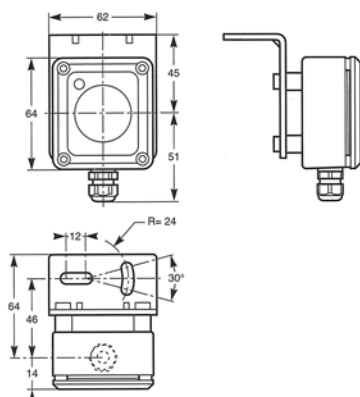
## 7/4 UJA single-antenna receiver



## 7/5 UJD processing unit



## 7/6 UJF infrared transmitter module



## 8/1 - List of available frequencies for France, Italy, Spain

Code	Freq. MHz
F01 (2)	433.1000
F02 (2)	433.1250
F03 (2)	433.1500
F04 (2)	433.1750
F05 (2)	433.2000
F06 (2)	433.2250
F07 (2)	433.2500
F08 (2)	433.2750
F09 (2)	433.3000
F10 (2)	433.3250
F11 (2)	433.3500
F12	433.3750
F13	433.4000
F14	433.4250
F15	433.4500
F16	433.4750

Code	Freq. MHz
F17	433.5000
F18	433.5250
F19	433.5500
F20	433.5750
F21	433.6000
F22	433.6250
F23	433.6500
F24	433.6750
F25	433.7000
F26	433.7250
F27	433.7500
F28	433.7750
F29	433.8000
F30	433.8250
F31	433.8500
F32	433.8750

Code	Freq. MHz
F33 (1)	433.9000
F34 (1)	433.9250
F35 (1)	433.9500
F36	433.9750
F37	434.0000
F38	434.0250
F39	434.0500
F40	434.0750
F41	434.1000
F42	434.1250
F43	434.1500
F44	434.1750
F45	434.2000
F46	434.2250
F47	434.2500
F48	434.2750

Code	Freq. MHz
F49	434.3000
F50	434.3250
F51	434.3500
F52	434.3750
F53	434.4000
F54	434.4250
F55	434.4500
F56	434.4750
F57	434.5000
F58	434.5250
F59	434.5500
F60	434.5750
F61	434.6000
F62	434.6250
F63	434.6500
F64	434.6750

(1) Congested frequency, to be avoided in France

Note : As specified on page 1, the transmit frequency can be changed. The frequency reconfiguration procedure is detailed in the installation manual.

(2) List of available frequencies for Spain

## 8/2 - List of available frequencies for Austria, Belgium, Denmark, Finland, Germany, Norway, The Netherlands, Sweden, Switzerland

Code	Freq. MHz
D01	433.1000
D02	433.1250
D03	433.1500
D04	433.1750
D05	433.2000
D06	433.2250
D07 (4)	433.2500
D08	433.2750
D09 (4)	433.3000
D10	433.3250
D11(4)	433.3500
D12	433.3750
D13	433.4000
D14	433.4250
D15	433.4500
D16	433.4750

Code	Freq. MHz
D17	433.5000
D18	433.5250
D19	433.5500
D20 (3)	433.5750
D21 (4)	433.6000
D22 (3)	433.6250
D23	433.6500
D24 (3)	433.6750
D25 (4)	433.7000
D26 (3)	433.7250
D27 (4)	433.7500
D28 (3)	433.7750
D29	433.8000
D30 (3)	433.8250
D31	433.8500
D32 (3)	433.8750

Code	Freq. MHz
D33	433.9000
D34 (3)	433.9250
D35	433.9500
D36 (3)	433.9750
D37	434.0000
D38 (3)	434.0250
D39	434.0500
D40	434.0750
D41	434.1000
D42	434.1250
D43 (4)	434.1500
D44	434.1750
D45	434.2000
D46	434.2250
D47	434.2500
D48	434.2750

Code	Freq. MHz
D49	434.3000
D50	434.3250
D51	434.3500
D52	434.3750
D53 (4)	434.4000
D54	434.4250
D55 (4)	434.4500
D56	434.4750
D57 (4)	434.5000
D58	434.5250
D59	434.5500
D60	434.5750
D61	434.6000
D62	434.6250
D63	434.6500
D64	434.6750

(3) list of available frequencies for Denmark

(4) list of available frequencies for Switzerland

## 8/3 - List of available frequencies for UK

Code	Freq. MHz
G01	458.5125
G03	458.5375
G05	458.5625
G07	458.5875
G09	458.6125
G11	458.6375
G13	458.6625
G15	458.6875
G17	458.7125
G19	458.7375
G21	458.7625
G23	458.7875

## 8/4 - List of available frequencies for Canada

Code	Freq. MHz
C02	458.0625
C03(*)	458.0875
C04	458.1125
C05	458.1375
C06	458.1625
C07	458.1875
C08	458.2125
C09	458.2375
C10	458.2625
C11	458.2875
C12	458.3125
C13	458.3375
C14	458.3625
C15	458.3875
C16	458.4125
C17	458.4375
C18	458.4625
C19	458.4875
C20	458.5125

Code	Freq. MHz
C21	458.5375
C22	458.5625
C23	458.5875
C24	458.6125
C25	458.6375
C26	458.6625
C27	458.6875
C28	458.7125
C29	458.7375
C30	458.7625
C31	458.7875
C32	458.8125
C33	458.8375
C34	458.8625
C35	458.8875
C36	458.9125
C37	458.9375
C38	458.9625
C39	458.9875

## 8/5 - Other countries: contact us












## 8/6 - Radio approvals

Country	approval number
Austria	GZ 422 901-ZB
Belgium	RTT/TI/X070
Canada	CANADA 2126 203 223
Denmark	94146-R
Finland	FI 95080123
France	960 364PPLO
Germany	G112 345E
Italy	DGPFG/SEGR/2/03/335384/FO
Norway	NO 95000682-R
Sweden	UE950187
The Netherlands	NL 950 11976
UK	12341

(\*) Frequency reserved for rental equipment.

## 9/1 Complete systems

Including transmitter + receiver + processing unit + charger + interconnect cable + IR option on request

Ref.	Number of buttons	UJE transmitter	UJD processing unit	UJA 1-antenna receiver	UJF infrared module	UJC charging unit 230V AC *	
						standard	fast
UJ1 ●●● ❖ □ UJ2 ●●● ❖ □	8 12						
UJ3 ●●● ❖ □ UJ4 ●●● ❖ □	8 12						

●●● frequency code (see page 11)    □ Processing unit supply voltage: R = 24 V AC    T = 110 V AC  
❖ : A = Standard Charger    S = 48 V AC    U = 230 V AC    2 = 24 V DC.  
C = fast charger

\* Other voltages available on request. Supplied configured for 110 V AC with "C" frequency codes (Canada)

## 9/2 Separate components

Transmitters	
UJE ●●● 10	8-button transmitter without IR startup feature
UJE ●●● 11	8-button transmitter with IR startup feature
UJE ●●● 20	12-button transmitter without IR startup feature
UJE ●●● 21	12-button transmitter with IR startup feature
Receivers	
UJA ●●● 00	Single-antenna receiver + 1 antenna
Infrared transmitter modules	
UJF 1 0 0 0 0	Kit comprising 1 IR transmitter modules
UJF 0 0 0 0 0	Kit comprising 2 IR transmitter modules
Charging unit	
UJC 0 0 0 0 U	Wall-mounted standard charging unit for 8 and 12 button- transmitters - 230 V AC
UJC 0 0 0 0 T	Wall-mounted standard charging unit for 8 and 12 button- transmitters - 110 V AC
UJC 0 S 0 0 U	Wall-mounted fast charging unit for 8 and 12 button- transmitters - 230 V AC
UJC 0 S 0 0 T	Wall-mounted fast charging unit for 8 and 12 button- transmitters - 110 V AC

●●● frequency code (see section page 11)

## 9/3 Accessories

Accessories (supplied with units)	
UJW E 1000	Shoulder strap
UJW P2010	10 m coaxial cable for receiver/processing unit connection
VUB 084	400 MHz antenna



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Processing units	
UJD 1 A 0 0 U	Processing unit for 8-button transmitter - 230 V AC
UJD 1 A 0 0 R	Processing unit for 8-button transmitter - 24V AC
UJD 1 A 0 0 S	Processing unit for 8-button transmitter - 48V AC
UJD 1 A 0 0 T	Processing unit for 8-button transmitter - 110V AC
UJD 1 A 0 0 2	Processing unit for 8-button transmitter - 24V DC
UJD 2 A 0 0 U	Processing unit for 12-button transmitter - 230V AC
UJD 2 A 0 0 R	Processing unit for 12-button transmitter - 24V AC
UJD 2 A 0 0 S	Processing unit for 12-button transmitter 48V AC
UJD 2 A 0 0 T	Processing unit for 12-button transmitter - 110 V AC
UJD 2 A 0 0 2	Processing unit for 12-button transmitter - 24V DC

Other accessories (to be ordered separately)	
UJW P2020	20 m coaxial cable for receiver/processing unit connection
UJWF 2010	10 m shielded cable for IR module/processing unit extension link

The products presented in this document are subject to change; product descriptions and characteristics are not contractually binding.

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