

**COMPACT**

**EASY TO HANDLE**

**FLEXIBLE**



OPERATOR MODULE

# Beta

For Ex-hazardous areas

The Beta operator module adapts to your application to make your process more efficient. This easy-to-use handheld module gives you incomparable freedom of movement, precise quality manoeuvres, and higher productivity while ensuring your operators' safety. With the Beta operator module, experience today's cutting-edge technology.

**This operator module is designed for use in potentially explosive gases atmospheres classified 0, 1, 2, dust classified 20, 21, 22 and mines.**

## MAIN FEATURES

- > Configurable, intelligent bi-directional radio link exchanges information while adapting to the radio environment.
- > User-friendly screen display for look-up, selection, validation, configuration...
- > Compact, easy-to handle casing for one-hand control.
- > Quick and easy setup for application configuration thanks to **iDialog** software (labels, feedback, alarms, mapping actuators/outputs, interlocks, network features, access by PIN codes).
- > Easy to maintain thanks to its diagnostic aid system (information on screen display, iDialog analysis software).



## FULLY COMPLIANT WITH EUROPEAN DIRECTIVES :

ATEX manufacturer  
2014/34/EU

EC type  
certificate  
issued by  
LCIE



Machinery directive 2006/42/EC:

- Emergency stop
  - > SIL 3 per EN 61508-1-7
  - > Performance level PL e per EN ISO 13849-1 and -2
- EC type certificate issued by  
TUV NORD



No 44 250 11 382580 001

Radio and telecommunication  
terminal equipment

(low voltage, electromagnetic  
compatibility, radio spectrum)  
RED 2014/53/EU

## DEFINITION OF A POTENTIALLY EXPLOSIVE ATMOSPHERE

### How an explosion happens

An explosion is formed by an association of the following 3 elements :

■ **An oxidant :**

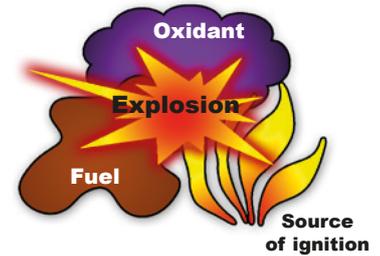
in our case, the oxygen in the air.

■ **A fuel :**

- ◆ A gas (methane, acetylene, ...)
- ◆ A fume (gasoline, solvent, ...)
- ◆ A dust (wood, sugar, grain, ...).

■ **A source of ignition :**

- ◆ An electric arc
- ◆ A mechanical spark
- ◆ A high temperature



### Consequences of an explosion

Explosions are responsible every year for around 6 deaths and 387 persons with permanent disability (IP) out of 379 accidents. These can produce major catastrophes, such as the explosion at the «AZF» plant at Toulouse (France) in 2001 or the «Blaye silo» near Bordeaux (France) in 1997, resulting in a large number of deaths and injuries, and destruction of the sites.

### Protection against explosions

It is necessary to evaluate the specific hazards created by explosible atmospheres, keeping in mind :

- ◆ the probability that **explosible atmospheres** will occur and persist,
- ◆ the probability that **sources of ignition**, including **electrostatic discharges**, are present and will become active and effective,
- ◆ the **installations, substances and methods** used, and their possible **interactions**,
- ◆ the extent of the **foreseeable consequences**.

The explosion hazards must be evaluated globally.

### In practice, this requires :

- ▣ Identification of zones representing a hazard and substances which could create explosible atmospheres.
- ▣ Classification of the explosive atmospheres in zones where there is an explosion hazard, assisted if necessary, by an outside organization.
- ▣ Definition of the equipment required to carry out the project.

With reference to user ATEX directive 99/92/CE.

The zones are standardised in accordance with their degree of dangerousness.

■ **Definition of explosion hazard zones linked to :**

**GASES, FUMES AND FOG**

**ZONE 0 :** location where an explosive atmosphere, consisting of a mixture with the air of combustible material in the form of gases, fumes or fog, is present continuously or over extended periods of time, or frequently.

**ZONE 1 :** location where an explosive atmosphere, consisting of a mixture with the air of combustible materials in the form of gases, fumes or fog, is likely to form occasionally under normal operation.

**ZONE 2 :** location where an explosive atmosphere, consisting of a mixture with the air of combustible materials in the form of gases, fumes or fog, is not likely to form during normal operation, or should such a formation occur, is nonetheless only of short duration.

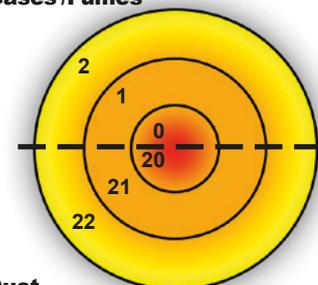
**DUST**

**ZONE 20 :** Location where an explosive atmosphere in the form of a cloud of combustible dust is present in the air continuously, or over extended periods of time, or frequently.

**ZONE 21 :** Location where an explosive atmosphere in the form of a cloud of combustible dust may occasionally form in the air during operation.

**ZONE 22 :** Location where an explosive atmosphere in the form of a cloud of combustible dust is not likely to form in the air during normal operation, or should such a formation occur, is nonetheless only of short duration.

**Gases /Fumes**



**Dust**

- Continuous hazard
- Hazard present during normal operating conditions
- Limited hazard in the event of failure of a system (limited in time)

DEFINITION OF MARKINGS  
ON ATEX - IECEX PRODUCTS

Since April 20, 2016, all Ex products must satisfy the requirements of the directive ATEX 2014/34/UE, the evolution of the standard 60079-0 leads to a new product marking presented in the following tables :

**Operator modules Beta ATEX :**



**Beta 2 ATEX**

CE 0081

1 2 3  
**II 1 G D**

4 5 6 7  
**Ex ia IIB T4 or 145°C Ga (1)**

8 9 10 7  
**Ex ia IIIC T135°C or T145°C Da (1)**

1 2 3  
**II 2 G D**

4 5 6 7  
**Ex ia IIC T4 or 145°C Gb (1)**

8 9 10 7  
**Ex ia IIIC T135°C or T145°C Db (1)**

1  
**I M1**

**Ex ia I Ma**

11  
**LCIE 14 ATEX 3055 X**

12  
**IECEX LCIE 14.0049 X**

(1) Temperature classes depending on Tamb :  
-20°C ≤ Tamb ≤ +40°C, temperature classes are T4 for gas and T135°C for dust.  
+40°C ≤ Tamb ≤ +50°C, temperature classes are 145°C for gas and T145°C for dust.

Below are the tables to understand the ATEX marquing :

**1 Device group**

Device group	Application
Group I	Electrical devices intended for use in firedamp mines. (underground work in the mines and parts of ground installations) => Protection against firedamp
Group II	Electrical devices intended for all other explosible atmospheres than firedamp mines (ground industries) => Protection against explosions

**2 3 ATEX classification**

Category of equipment	Flammable substances	Degree of protection	Description
1	G Gas D Dust	Very high level	Devices capable of operating in the atmospheres where the risk of explosion is permanent or almost permanent (zones 0, 1, 2 and 20, 21, 22)
2	G Gas D Dust	High level	Devices capable of operating in the atmospheres where the risk of explosion is frequent (zones 1, 2 and 21, 22)
3	G Gas D Dust	Normal	Devices capable of operating in the atmospheres where the risk of explosion is occasional (zones 2 and 22)

#### 4 Protection modes for electrical equipment in gaseous atmospheres

Protection mode		Standard	Basic principle	Application in ZONE		
				0	1	2
d	Explosion proof enclosure	EN/IEC 60079-1	The extremely heavy duty enclosure contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.		●	●
e	Enhanced safety	EN/IEC 60079-7	The components inside the enclosure must not produce arcs, sparks or dangerous temperatures under normal utilization conditions. The enclosure must be tight to IP 54 and withstand impacts.		●	●
i	Intrinsic safety	ia	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●
		ib	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.		●
m	Encapsulation	EN/IEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.		●	●
n	Zone 2	EN/IEC 60079-15	This protection mode is only suitable for devices intended for zone 2 where the risk of explosion is low. It combines the enhanced safety mode "e" with lower protection requirements.			●
o	Immersion in oil	EN/IEC 60079-6	The material or the electrical circuit is immersed in oil. The explosive mixture is located above the liquid and cannot be ignited by the electrical circuit.		●	●
p	Internal overpressure	EN/IEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.		●	●
q	Powdery filler	EN/IEC 60079-5	For this protection mode, all the electronics is encapsulated in an inert powdery material to prevent electrical arcs or electrical sparks.		●	●

#### 5 Classification of gases and fumes by explosion groups (non-exhaustive list)

Group IIA		Group IIB		Group IIC
Propane	Acetone	Ethylene	Ethyl oxide	Acetylene
Ethane	Hexane	Diethylene	Sulphuretted hydrogen	Hydrogen
Butane	Methanol	Ethyl ether	Ethanol	Carbon disulfide
Benzene	Paint thinners	Cycloprodene		
Pentane	Natural gas	Butadiene 1-3		
Heptane		Propylene oxide		

#### 6 Gas temperature classes

The safe use of equipment in dangerous areas requires knowledge of the gas group and compare the temperature auto-ignition of gaseous mixtures treated to the temperature of equipment marking.

**The maximum surface temperature of the material must always be less than the autoignition temperature of the gas present in the dangerous area.**

Temperature class	MAXIMUM surface temperature of electrical equipment	Ignition temperatures of FLAMMABLE materials
T1	450°C	> 450°C
T2	300°C	> 300°C
T3	200°C	> 200°C
T4	135°C	> 135°C
T5	100°C	> 100°C
T6	85°C	> 85°C

### 7 Equipment protection level (EPL)

Traditional relationship between level of protection and areas / categories (without additional risk assessment).

Equipment protection level (EPL)	Normal range of application	Category (2014/34/UE)
Ga	0 (and 1 and 2)	1G
Gb	1 (and 2)	2G
Gc	2	3G
Da	20 (and 21 and 22)	1D
Db	21 (and 22)	2D
Dc	22	3D
Ma / Mb	mines	M1 / M2

### 8 Protection modes for electrical equipment in dusty atmospheres

Protection mode			Standard	Basic principle	Application in ZONE		
					20	21	22
i	Intrinsic safety	ia	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
		ib	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
m	Encapsulation	EN/IEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.	●	●	●	
p	Internal overpressure	EN/IEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.	●	●	●	
t	Explosion proof enclosure	EN/IEC 60079-31	The extremely heavy duty envelope contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.	●	●	●	

### 9 Classification of dust by explosion groups

Explosion groups	Type of dust	Fundamental principle
Group IIIA	Combustible dust in suspension	Very fine solid particles of nominal size of about 500 microns or less, can be suspended in the air, which can be deposited because of their own weight and that can burn or be consumed in the air and are susceptible to form explosive mixtures with air under conditions of atmospheric pressure and normal temperature.
Group IIIB	Non-conductive dust	Combustible dust electrical resistivity greater than $10^3 \Omega.m$ . Size < 500 $\mu m$
Group IIIC	Conductive dust	Combustible dust electrical resistivity at or below $10^3 \Omega.m$ . Size < 500 $\mu m$

### 10 Maximum surface temperature for dusty atmospheres

### 11 LCIE : certificate of EC type examination number

### 12 LCIE : IECEx certificate number



OPTIONAL  
PUSHBUTTON



OPTIONAL  
M12 INDUSTRIAL  
CONNECTOR FOR  
CONNECTING TWO DRY  
CONTACTS



OPTIONAL  
BNC ANTENNA  
CONNECTOR



BIDIRECTIONAL  
RADIO LINK

BREATHABLE  
MEMBRANE  
PREVENTS  
CONDENSATION



OPTION  
BUZZER 80 dbA

INTEGRATED  
REINFORCED ABS  
AND PROTECTIVE  
FOAM

SEALS

NAVIGATION  
BUTTONS

CASING SHAPED  
TO PREVENT  
UNINTENTIONAL  
ACTIONS



2+4 model

EMERGENCY STOP  
PALMSWITCH  
SIL 3 - PL e

OPTION  
AUTOMATIC  
DETECTION OF  
INACTIVITY  
«DEAD MAN»  
  
OPTION  
ALARM DEVICE FOR  
ISOLATED WORKER  
DATI

TOUGH BACKLIT  
SCREEN WITH  
ANTI-REFLECTION,  
SHOCK-PROOF,  
ANTI-SCRATCHING  
FEATURES

MULTIMODES  
OPTION

LABELS FOR  
IDENTIFYING  
FUNCTIONS



6+4 model

ON / VALIDATION  
BUTTON

HIGH-CAPACITY  
PLUG-IN BATTERY  
(6+4 MODEL)

CARRYING  
STRAP



SEALED USB  
INTERFACE FOR  
DIAGNOSTICS,  
CONFIGURATION

## DESCRIPTION

The operator module comes in two housing versions :

> « 2+ 4(a) »<sup>[a]</sup> operator module with 2 function buttons<sup>[b]</sup> :

- 2 single-action pushbuttons

**OR** 2 double-action pushbuttons

> « 6 + 4 »<sup>[a]</sup> operator module with 6 function buttons<sup>[b]</sup> :

- 6 single-action pushbuttons

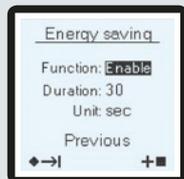
**OR** 6 double-action pushbuttons

**OR** 4 double-action pushbuttons + 2 single-action pushbuttons (under the navigation buttons)

<sup>[a]</sup> Each version has 2 navigation pushbuttons, 1 «On/validation» pushbutton and 1 emergency stop palmswitch.

<sup>[b]</sup> The single-action pushbuttons can be configured as selectors for 2, 3 or «n» positions with status indication on the screen.

The screen on the operator module allows you to easily configure and choose items such as :



- > The screen language
- > The transceiver which you want to use
- > The radio transmit frequency and power
- > The duration of the « standby » time delay (Automatically stops operator module and associated transceiver if not used for a defined period of time)
- > The different operating modes of the equipment (32 max.)

It also allows to view :

- Battery charge level
- Radio communication
- Equipment labels and controlled functions (max 96 different labels for selectors)
- Equipment feedback (16 max feedback with 10 labels / feedback and max 48 labels in total)
- Alarms (8 for application use + 8 for system)

### Compatibility:

These operator modules work with **Elio**, **Alto**, **Timo** transceivers to be defined according the application.

## TECHNICAL CHARACTERISTICS

### MECHANICAL CHARACTERISTICS AND ENVIRONMENTAL WITHSTAND CAPACITY

Housing material	shock-resistant reinforced ABS with anti-static charge
Tightness	IP65
Weight (with battery)	2 + 4 buttons : 400 g 6 + 4 buttons : 485 g
Dimensions	2 + 4 buttons : 182 x 75 x 50 mm 6 + 4 buttons : 235 x 75 x 50 mm
Stowed	2 + 4 buttons : on charger support for operator module 6 + 4 buttons : on mechanical support
Carried	by 2-point shoulder strap

### ENVIRONMENTAL WITHSTAND CAPACITY

Operating temperature range	-20°C to + 50°C
Storage temperature range of housing alone	-20°C to + 70°C
Storage temperature range of battery	-20°C to + 50°C

### ELECTRICAL AND RADIO CHARACTERISTICS

Power supply	Li-ion battery 2 + 4 buttons : internal battery 6 + 4 buttons : plug-in battery
Mode de charge de la batterie	2 + 4 buttons : on charger support for operator module 6 + 4 buttons : on charger for battery
Endurance (25°C) of radio link, activated	
100% time	10 hours
Frequency selection	64 frequencies on 433-434 MHz
Manual / automatic	12 frequencies on 869 MHz 64 frequencies on 911-918 MHz
Transmit power	< 10 mW (license free)
Range limitation	10 power levels, configurable
Modulation	FM
Average range <sup>[1]</sup>	100 m in industrial space <sup>[1]</sup> 300 m in open space <sup>[1]</sup>
Charging time (endurance > 80%)	3 H (20 mn of charge get 1h autonomy)
Charging temperature range	0°C to + 40°C

### FUNCTIONAL CHARACTERISTICS

Display	Backlit LCD display, 128 x 128 pixels 42mm (L) x 40mm (H) Black / White
USB interface for configuration and diagnostics	mini-B 5-point USB connector Easily accessible by cover on back contact of operator module
Operating indications	Visible on screen (radio link status, battery status, status of buttons, information feedback...)
Function buttons	2 or 6 pushbuttons (available as single or double-action buttons and configurable as selectors with n positions)
Navigation and startup buttons	2 pushbuttons to configure the product 1 On / Validation button (for startup and validation of menus on screen)
Emergency stop	2 positions with rotary unlock system
Standby function	User-definable time delay (from 1 s to infinity)

<sup>[1]</sup> Range varies according to environment conditions around operator module and reception antenna (steel works, metal walls, etc.).

## ADDITIONAL OPTIONS

### M12 INDUSTRIAL CONNECTOR FOR 2 DRY CONTACTS

- 4 connection points
- switching capacity < 10 mA
- male socket
- supplied with cap

## ACCESSORIES



### Standard charger support for Beta 2 operator module

#### Standard version references

PWCB020  
Dimensions : 220x82x76 mm  
Power supply : 12/24 VDC  
Power : 7w

#### References for version with 2 relays + 1 logic input + buzzer

PWCB021

#### References version with 1 relay + 4 logic inputs + buzzer

PWCB022

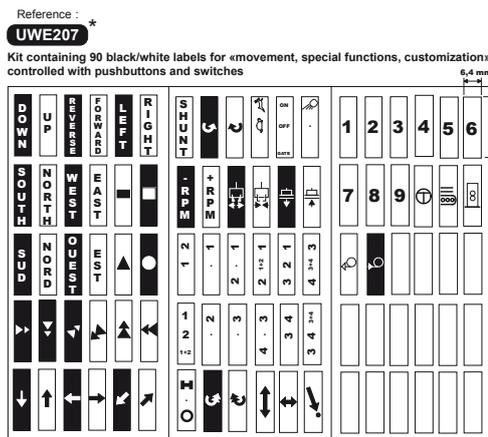


### Mechanical support for Beta 6 operator module

Reference : PWCB06M  
Dimensions : 272x82x76 mm

### Sheet of adhesive labels for operator module :

The button functions are identified by adhesive labels in the recesses provided in the operator module casing next to the pushbuttons.



\* = standard sheet of labels supplied with operator module



### Battery charger

Reference : PWC  
Dimensions: 170x65x36 mm  
Power supply : 12/24 VDC  
Power : 7w

### Plug-in battery for Beta 6 operator module

Reference : PYB  
Dimensions : 57x56x16 mm  
Voltage : 3,7V  
Capacity : 1900mAh  
Technology : lithium Ion

### Sheet of adhesive labels for your mobile equipment :



**IMPORTANT :**  
The battery shall not be charged in potentially explosive area.



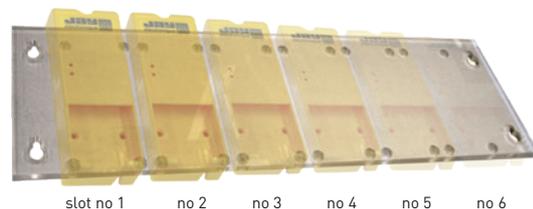
### Mains power adapter for battery charger

Reference : UBCU  
Dimensions : 41x72x39 mm  
Power supply : 100-240VAC  
Output : 12VDC  
Power : 7 w



### Cigarette lighter plug adapter for battery charger

Reference : PWA4  
Dimensions : 90x20x20 mm  
Power supply : 12-24VDC  
Output : Power supply



### Rack for battery chargers (6 slots)

Sold without charger  
Reference : PWR  
Dimensions : 470x147x8 mm



### Mains power adapter for rack

Reference : PWAUR  
Power supply : 100-240VAC  
Output : 12VDC  
Power : 36 w

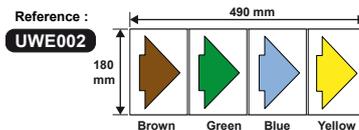
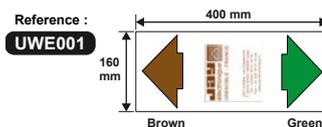


### Removable 2-point shoulder strap

Reference : PYM110

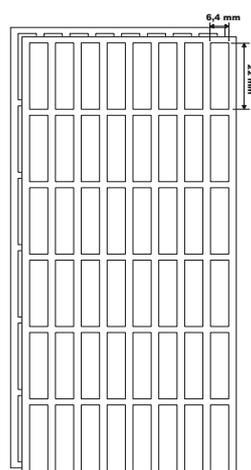
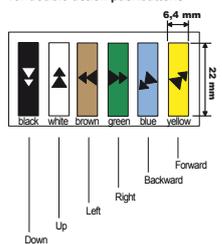
### M12 female 4/5 points cable

Reference : PWM201  
Length : 2 m



Reference : UWE205  
Kit containing 48 white blank labels + 48 transparent protecting labels for customised markings

Reference : UWE202  
Kit of 6 colored labels «movements» for double-action pushbuttons



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