

# EN54-23 Open Class—Symphoni Series of Loop Powered Beacon-Sounders



INDOOR BEACON-SOUNDER



OUTDOOR BEACON-SOUNDER

Fig. 1: General View of EN54-23 Open Class—FC410LPBS Symphoni Series



## Introduction

The EN54-23 Open Class—FC410LPBS Symphoni Series of Loop Powered Beacon-Sounders are designed to be driven from a FIRECLASS controller via the addressable loop.

The EN54-23 Open Class-Symphoni Series of Loop Powered Beacon-Sounders consist of:

- FC410LPBS-R: Beacon-Sounder (indoor) red housing
- FC410LPBS-W: Beacon-Sounder (indoor) white housing
- FC410LPBS LP: Beacon-Sounder IP65 (outdoor) red housing

The sounder has two volume settings:

- High (103dB ±3) or
- Low (90dB ±3).

The beacon emits a white flashing light and it has two flash rates:

- Slow Flash (½ Hz) or
- Fast Flash (1 Hz).

The EN54-23 Open Class—FC410LPBS Symphoni devices are synchronised, but not synchronous with other sounders (FC430SB/FC410SNM) and beacons (FC430SAB).

The first flash of the beacon is synchronised with the start of the tone.

The EN54-23 Open Class—FC410LPBS Symphoni devices have a built in two port isolator.

## Technical Specification

### Mechanical Characteristics

The overall dimensions are shown in Fig. 2. All dimensions are in mm.

Parameter	Value
<b>Weight:</b>	
■ Indoor Beacon-Sounder	216 g
■ Outdoor Beacon-Sounder	298 g
<b>Materials:</b>	
■ Housing	ABS FR or ABS/PC FR
■ Housing Colour	White 21-0302 Red 21-0301
Mounting Requirements	50 mm or 60 mm Besa box or surface mount

Table 1: Technical Specification

The indoor back box has two drill positions (on the bottom) for gland holes.

The outdoor back box has 3 drill positions (top and bottom) for gland holes.

The indoor beacon-sounder body clips onto the backbox and can only be removed by the use of a special key.

The outdoor beacon-sounder is secured to the backbox by four Allen key screws.

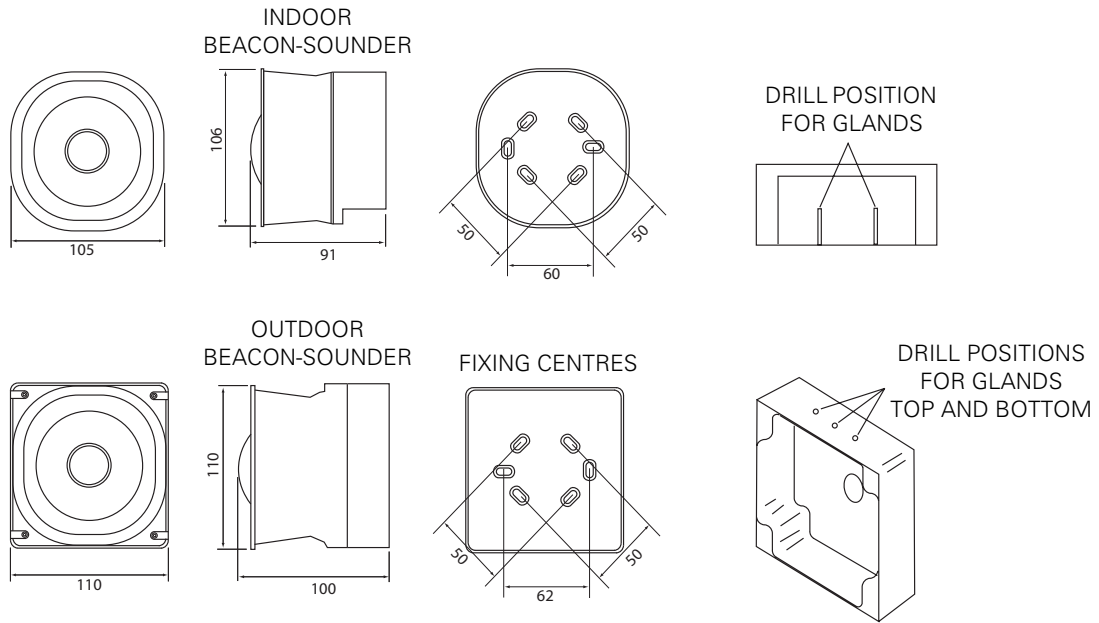


Fig. 2: Overall Fixing Dimensions—FC410LPBS Symphoni Series

**Environmental Characteristics**

Parameter	Value
<b>Temperature:</b>	
■ Operating:	
Indoor	-10°C to +55°C
Outdoor	-20°C to +70°C
■ Storage:	
Indoor	-25°C to +70°C
Outdoor	-25°C to +70°C
Humidity	Up to 95% RH (non-condensing)
Pressure	Sounder output is quoted for atmospheric pressure of 1000 mBar
Vibration	Meets the requirements of EN 54-3 and EN 54-23.
Shock	Meets the requirements of EN 54-3 and EN 54-23.
Corrosion	Passes the SO <sub>2</sub> corrosion test from EN 54-3 and EN 54-23.
<b>IP Rating:</b>	IP code to EN 60529 in wall mounted orientation:
■ Indoor	IP21C (Type A)
■ Outdoor	IP65 (EN54-3 and EN54-23 approved to IP33C Type B)

Table 2: Environmental Characteristics

**Performance Characteristics**

Parameter	Value
<b>Sound Performance:</b>	
SPL at 90° at a distance of 1m.	
High:	103 dB ±3
Low:	90 dB±3
<b>Note:</b>	EN54-3:2001 does not test at 90°.
<b>Light Performance:</b>	EN54-23 Category O:
■ Light Colour	White flashing light
■ Flash Rate:	Fast flash 1 Hz, or slow flash ½ Hz

Table 3: Performance Characteristics

**EMC:**

The EN54-23 Open Class—Symphoni devices comply with the following:

- Product family standard EN50130-4 in respect of:
  - Conducted Disturbances,
  - Radiated Immunity,
  - Electrostatic Discharge,
  - Fast Transients and
  - Slow High Energy.
- EN61000-6-3 for Emissions

**Electrical Characteristics**

Parameter	Value
Addressable Loop Voltage	20 - 40 Vdc
<b>DC Loop Loading:</b>	
■ Quiescent	320µA
■ Alarm	See Table 5: "Alarm Current"
<b>Isolator:</b>	
Maximum Loop Voltage	40 Vdc
Minimum Loop Voltage	20 Vdc
Maximum Rated Continuous Current (Isolator Closed)	2A
Maximum Rated Switching Current (s/c)	2A
Maximum Leakage Current (Isolator Open)	6 mA into zone (10 mA into Isolator)
Maximum Series Impedance (Isolator Closed)	0.25 Ω
Isolator Switching Threshold (Isolator Closed to Open)	20 V or below
Isolator Switching Threshold (Isolator Open to Closed):	2.9 V to 3.5 V from s/c

Table 4: Electrical Characteristics

**Alarm Current**

Parameter	Low	High	Unit
Sound Output	90	103	dB
Sounder Only	3.15	8.65	mA
Sounder and Beacon 0.5 Hz	8.73	14.2	mA
Sounder and Beacon 1 Hz	9.8	15.3	mA

Table 5: Alarm Current

**Sounder Tones**

Table 6 details the tones available for selection in FIRE-CLASS Express.



**NOTICE: Bell Tone**

This is a simulated bell tone with a limited bandwidth. It is not advisable to mix conventional bells and electronic sounders producing a simulated bell tone.

**Approved Tones**

Tables 7 to 12 detail the tones approved by LPCB to the specification shown. The data applies to both horizontal and vertical planes.

Device Mode	Name	Tone Description			Monitored (High 103 dB and Low 90 dB No pulsing in FIRECLASS Express)	Monitored with Pulse Pattern Assigned in FIRECLASS Express
		Pattern	Frequency (Hz)	Rate		
1	Dutch Slow Whoop	Sweep	500 to 1200	500 Hz rising to 1200 Hz over 3.5 s silence 0.5 s repeat	Yes	No
2	7 Hz Fast Sweep	Sweep	800 to 970	0.1428 s ramp 7 Hz	Yes	No
3	BS 1 Hz Sweep	Sweep	800 to 970	1H z	Yes	No
4	2 Tone	Alternating	660/880	500 ms per tone	Yes	No
5	Temporal 4	Intermittent	880	500 ms on 500 ms off x 4 followed by 1.5 s silence	Yes	No
6	Temporal 3	Intermittent	880	500 ms on 500 ms off x 3 followed by 1.5 s silence	Yes	No
7	March Time Beep	Intermittent	880	500 ms - on 500 ms - off	Yes	No
8	Continuous 970	Continuous	970	Steady	Yes	No
9	Continuous 850	Continuous	850	Steady	Yes	No
10	DIN 1 Hz Sweep	Sweep	1200 to 500	1200 Hz falling to 500 Hz over 1s and repeat	Yes	No
11	Banshee LF Buzzer	Sweep	800 to 950	120 Hz	Yes	No
12	3 Hz Banshee Fast Sweep	Sweep	800 to 950	3 Hz	Yes	No
13	9 Hz Banshee Fast Sweep	Sweep	800 to 950	9 Hz	Yes	No
14	Alternating	Alternating	554/440	554 Hz for 100 ms and 440 Hz for 400 ms	Yes	No
15	Yodalarm	Alternating	800 / 1000	250 ms for each frequency	Yes	No
16	Conventional Bell (Note1)	Continuous	1450	Steady	Yes	No

Table 6: Sounder Tones

Operational Performance Maximum Volume dB(A)		
Angle	40 V	20 V
15°	83	82
45°	92	91
75°	95	94
105°	95	93
135°	92	91
165°	81	80

Table 7: Continuous 850 Hz

Operational Performance Maximum Volume dB(A)		
Angle	40 V	20 V
15°	80	78
45°	91	90
75°	94	93
105°	93	92
135°	91	89
165°	80	79

Table 10: Temporal 3 880 Hz

Operational Performance Maximum Volume dB(A)		
Angle	40 V	20 V
15°	84	83
45°	94	93
75°	96	95
105°	96	94
135°	93	92
165°	83	83

Table 8: Dutch Slow Whoop 500Hz to 1200 Hz

Operational Performance Maximum Volume dB(A)		
Angle	40 V	20 V
15°	88	87
45°	92	92
75°	97	95
105°	99	97
135°	95	94
165°	87	86

Table 11: DIN 1 Hz Sweep - High Volume

Operational Performance Maximum Volume dB(A)		
Angle	40V	20V
15°	83	82
45°	93	92
75°	96	95
105°	95	94
135°	92	92
165°	83	82

Table 9: 7 Hz Fast Sweep

Operational Performance Maximum Volume dB(A)		
Angle	40 V	20 V
15°	78	77
45°	83	82
75°	88	87
105°	90	89
135°	86	85
165°	77	76

Table 12: DIN 1Hz Sweep - Low Volume

**Beacon Information**

Category O - open class device (see Table 13 and Fig. 3). The data applies to both the Slow Flash (1/2 Hz) and the Fast Flash (1 Hz).

The light distribution is cylindrically symmetrical about an axis at a right angle (Alpha of 90°) to the surface on which the device is mounted, i.e. when the device is mounted on a vertical wall, the light distribution is symmetrical about an axis extending horizontally through the centre of the device’s domed lens. The light distribution in Fig. 3 represents a cross-section through the volumetric shape using the values as indicated in Table 13.

Alpha [degrees]	Distance [metres]
90	3
75	3.1
60	3.15
45	2.15
30	1.95
15	0.75
0	0

Table 13: FC410LPBS Symphoni Series—0.4 lm/m<sup>2</sup> Illumination Distance

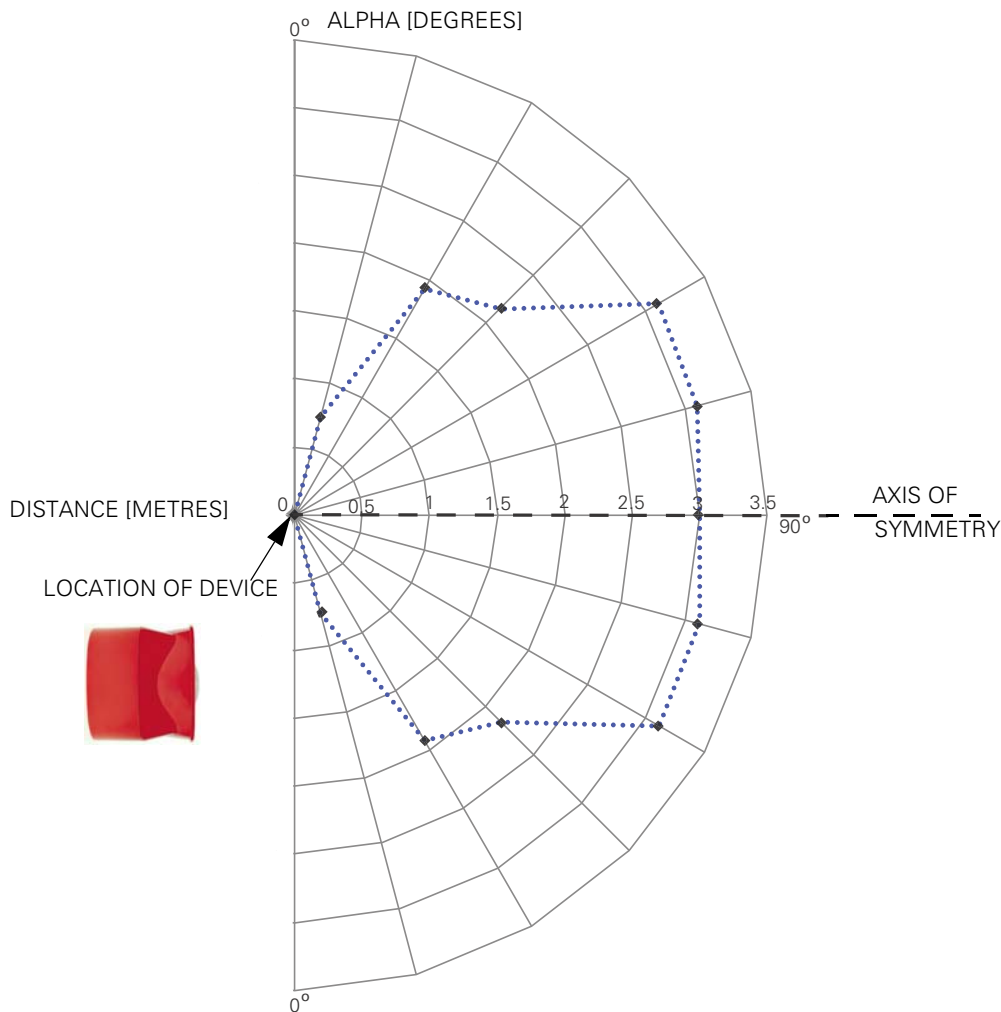


Fig. 3: FC410LPBS Symphoni Series—Graphical Illustration of Wall Mount Light Distribution

**Address Programming**

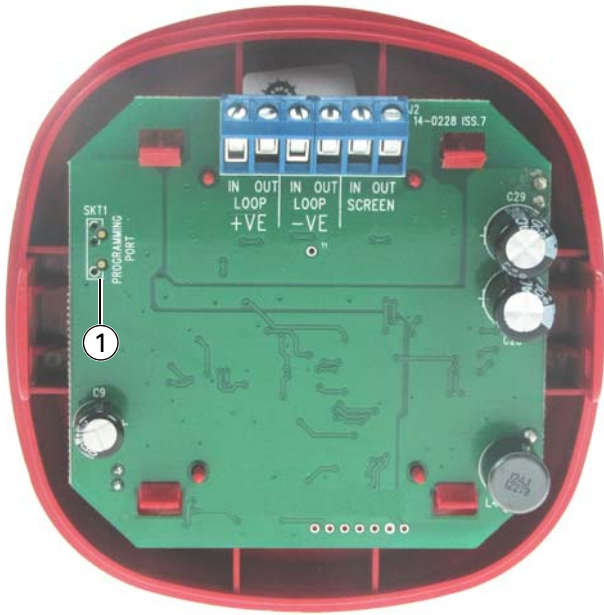


Fig. 4: EN54-23 Open Class—Symphoni Programming Port 1—Programming Port

The default factory address is set to 255. The device should be programmed with its loop address before installation using an FC490ST with an ancillary lead that plugs into the device's programming port (see Fig. 4). The EN54-23 Open Class—FC410LPBS Symphoni Series Beacon-Sounder uses 2 consecutive addresses on the addressable loop, starting from the chosen programmed address number. These addresses are automatically generated when a Symphoni Beacon-Sounder is selected in FIRECLASS Express. The address configuration is as follows:

Address	Type
n	Sounder Device
n+1	Beacon Device

Table 14: Address Configuration

**Symphoni Configuration**

The Sounder tone (Device Mode), sounder volume output (Sensitivity) and beacon flash rate (Device Mode) are configured in FIRECLASS Express. For system loading, refer to Publication, FC-D-LOOP-PI System Loading Guidelines.

**Sounder Beacon Processing Reference Document**



Refer to the latest version of the FIRECLASS Express Help File for information on Sounder Beacon Processing.

**Output Pulse Pattern**

Output pulse patterns are restricted such that the period between every High to Low transition and the following Low to High transition is a multiple of 2 seconds. Pulse patterns are also restricted to continuous tone patterns only.

**Fault Monitoring**

Both the sounder and beacon are monitored. The last 2 columns of Table 6, "Sounder Tones" on page 3 define if the sounder is monitored, as a function of volume setting and system configuration. Sounder Monitoring is also referred to as Reflective Sound Monitoring (RSM). For further details on the application of this function, refer to the Technical Publications of the relevant Control and Indicating equipment.

### Isolator Operation

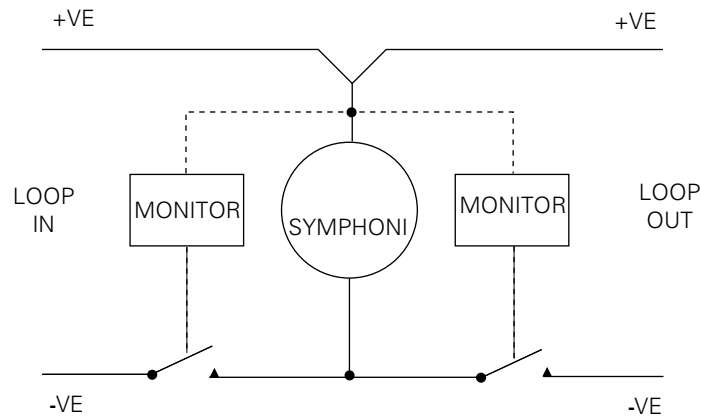


Fig. 5: Simplified Isolator Diagram

The built-in isolator serves as a protection device against short circuits. It operates by isolating the section of line containing the short circuit from devices on the line and from the rest of the line (refer to Fig. 5). Optimum operation requires the line to be wired as a loop, so that a section of line with a short circuit can be isolated between a pair of isolator devices (including Symphoni devices).

In order to enable the isolator’s use in a looped circuit, it is capable of passing current in both directions:

- Loop IN to Loop OUT or
- Loop OUT to Loop IN.

In the event of a line short circuit, the line isolator continues to power its associated Beacon-Sounder, providing that either Loop IN or Loop OUT remains intact. When a short circuit develops, the adjacent isolator devices will isolate both sides of the loop from the faulty device/cable.

The operation of the loop driver means that there are effectively 2 operational modes for the built-in isolator.

- When the loop is first powered, if a section of the line appears as a low impedance (with an equivalent resistance of  $<400 \Omega$ ), the isolator will restrict the power to that section of line until the fault is cleared.
- If a short circuit is introduced onto the line when the loop is already powered up, in most instances the controller’s internal protection will switch in before the line isolator. The voltage is then removed from the line by the controller, on restoration, the isolator devices will isolate the low impedance section of the line.



## Cabling

Cables should be selected in accordance with local standards. Cabling should be connected as shown in Fig. 6, ensuring correct polarity.

Each terminal connection will accept wire size up to 2.5 mm<sup>2</sup> (MICC or similar).



### NOTICE: Cabling Requirement

Couplers are to be used with MICC cable.

Suitable glands must be used with the outdoor device to keep the IP65 rating.

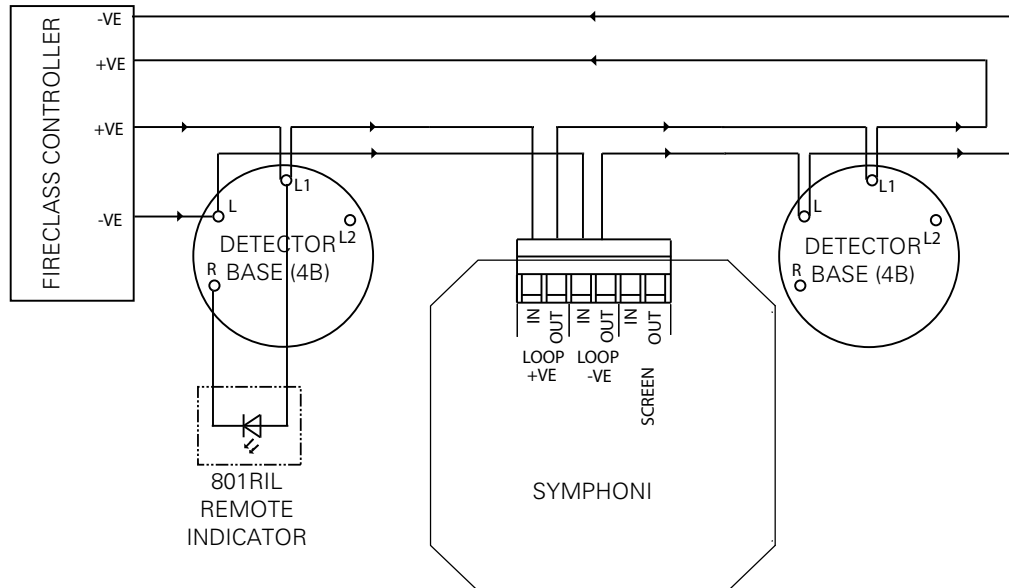


Fig. 6: Simplified Wiring Diagram

### CPR Information


 0832
Tyco Fire & Security GmbH, Victor von Bruns-Strasse 21, 8212, Neuhausen am Rheinfall, Switzerland
15
Fire alarm device – Sounder and Visual alarm device (VAD) with short circuit isolator for use in fire detection and fire alarm systems installed in and around buildings  516.800.970 FC410LPBS-R Type A DoP-2014-2006 516.800.971 FC410LPBS-W Type A DoP-2014-2007 516.800.972 FC410LPBS LP Type B DoP-2014-2008
<p style="text-align: center;"><b>Essential Characteristics</b></p> <p style="text-align: center;"><b>EN54-3: 2001 + A1:2002 + A2:2006</b></p> Performance under fire condition: Pass Operational reliability: Pass  <b>Durability:</b> Temperature resistance: Pass Humidity resistance: Pass Corrosion resistance: Pass Shock and vibration resistance: Pass Electrical stability: Pass Resistance to ingress: Pass  <p style="text-align: center;"><b>EN54-17:2005</b></p> Performance under fire conditions: Pass Operational reliability: Pass  <b>Durability:</b> Temperature resistance: Pass Vibration resistance: Pass Humidity resistance: Pass Corrosion resistance: Pass Electrical stability: Pass  <p style="text-align: center;"><b>EN54-23: 2010</b></p> Duration of operation: Pass Provision for external conductors: Pass Flammability of materials: Pass Enclosure protection: Pass Access: Pass Manufacturer's adjustments: Pass On-site adjustment of behaviour: Pass Requirements for software controlled devices: Pass Coverage volume: Pass Variation of light output: Pass Minimum and maximum light intensity: Pass Light colour: White Light temporal pattern / frequency of flashing: Pass / 0.5Hz and 1Hz Marking and data: Pass Synchronization: Pass  <b>Durability:</b> Temperature resistance: Pass Humidity resistance: Pass Shock and vibration resistance: Pass Corrosion resistance: Pass Electrical stability: Pass

Fig. 7: CPR Information

### Order Information

Product	Order Code
EN54-23—FC410LPBS-R Beacon-Sounder (indoor use) - red housing	516.800.970
EN54-23—FC410LPBS-W Beacon-Sounder (indoor use) - white housing	516.800.971
EN54-23—FC410LPBS LP Beacon-Sounder IP65 (outdoor use) - red housing	516.800.972

Table 15: Order Information