SM1P-Ex

MANUAL

ENGLISH

Document Reference:	Revision:	Date:
IECEx126	**AA.14**	**May22, 2024**

INTRODUCTION

The SM1P/PW/B/DP/XBT Ex Series of Headsets is a state-of-the-art hearing protection (i.e., protects against harmful noise) communication system that allows you to retain situational awareness whilst remaining in full contact with your team via Short- Range technology, as well as two-way radio or cellular device via Bluetooth® or wired connection.

The product meets the following international standards for use in explosive gas, dust, and mining environments. Check the product label to identify the ratings applicable to the headset.

II 2G Ex ib IIC T4Gb(-20°C ≤ Ta ≤ +40°C)
II 2D Ex ib IIIC T155^{o}C Db (-20°C ≤ Ta ≤ +40°C)
I M2Ex ib I Mb(-20°C ≤ Ta ≤ +60°C)

CII, Div 1 Grp A-D, T4 (-20°C ≤ Ta ≤ +40°C)
CI I, Zn1, AEx ibIIC T4Gb (-20°C ≤ Ta ≤ +40°C)
CII, Zn21, AEx ibIIIC T155^{o}C Db (-20°C ≤ Ta ≤ +40°C)

Situational awareness is provided by **SENS'** processing technology and environmental microphones mounted within the headset.

Connection through intrinsically safe communication devices is enabled by the SRCK61xxCCxx or SRCK62xxCCxx cable assemblies (available separately). Cable part numbers vary depending on the communication device connector. Please consult Sensear's website or your communications supplier for the appropriate cable.

For language translated manuals and further information, please refer to Sensear's website.

MAINTENANCE AND SAFETY INSTRUCTIONS

The SM1P-Ex has been designed such that minimal user maintenance is required. Only those parts listed on page 25 of this instruction manual are user replaceable.

SPECIFIC CONDITIONS OF USE Potential Electrostatic hazard, clean with damp cloth only.

WARNING The SM1P-Ex must not be disassembled. In the event of a malfunction the unit should be switched off and returned to Sensear Pty Ltd. The battery is not user replaceable; the SM1P-Ex must be returned to Sensear for battery replacement. Substitution of components may impair Intrinsic Safety.

WARNING Connection to the USB Connector located in the connector compartment of the right-hand ear-cup is not permitted. The USB is for service only.

WARNING The SM1P-Ex must not be charged in a hazardous area. The battery shall only be charged when the equipment is in a safe area using the class II charging supply via the jack socket on the left- hand ear cup; the maximum permitted voltage at this charging input is Um = 6V.

WARNING Connection to the multi-pin Hirose connector of the SM1P-Ex (wired version) shall only be done via an SRCK61xxCCxx SM1P-Ex Intrinsically Safe interface cable. No direct connection to the multi-pin Hirose connector is permitted.

ENTITY PARAMETERS

The following entity parameters are for when SM1P-Ex is used with SRCK61xxCCxx or SRCK62xxCCxx at the radio or intrinsically safe device end of the interface cable.

Entity Parameter	Value
U_i/Vmax	9V
C_i	0.09μF
L_i	0μH
Ii	2.22A
Pi	1.3W

MARKINGS

The SM1P-Ex contains the following markings:

Hazardous Location Class and Group and Temperature Class

A scratch-resistant classification label is located at the top of the left-side ear cup on the headset.

Product Model, Number Code, and Serial Number

A product model name, number and serial label are located at the top of the right-side earcup on the headset.

An eight-digit product code followed by a unique eight-digit serial number will be visible on the top of the outer cup and of the form:

MFP00PPPSSSSSSSS where 'MFP00PPP;' is the product number and 'SSSSSSSS' is the serial number.
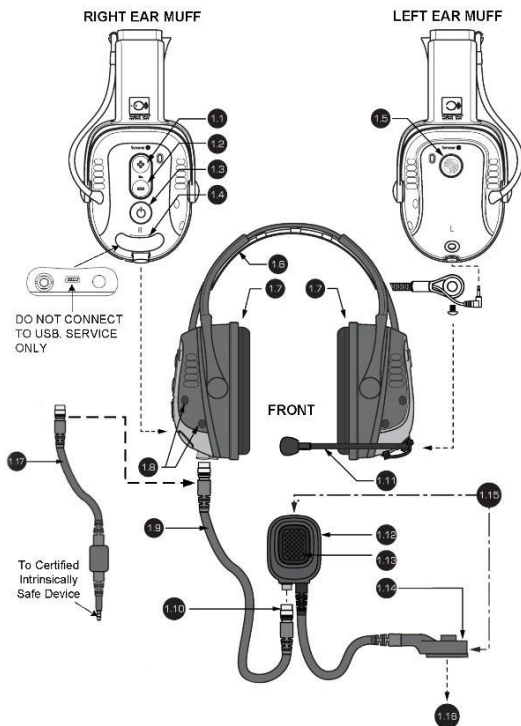
HEADSET ANATOMY

FIGURE 1

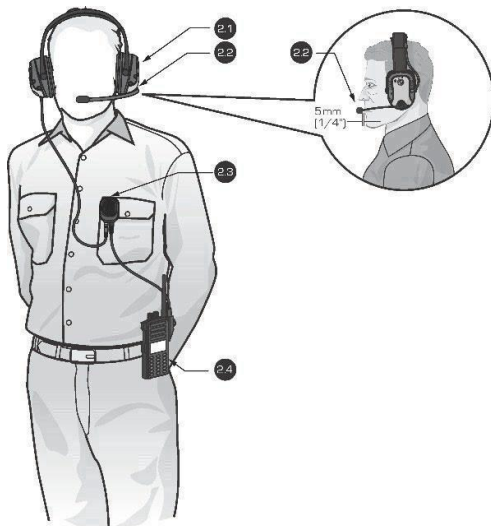| #	Description
1.1	Volume up button
1.2	Volume down button
1.3	Power button
1.4	Hatch cover, for programming and charging
1.5	Multi-function button (MFB)
1.6	Headband*
1.7	Ear cushions
1.8	SENS® Microphones
1.9	Headset cable
1.10	Headset connector
1.11	Boom microphone Mount-M5 Hex screw Connector - 2.5mm Audio jack
1.12	Inline PTT
1.13	Inline PTT button
1.14	Two-way radio connector (note, these will vary depending on your two-way radio)
1.15	SRCK61xxCCxx cable assembly
1.16	To the two-way radio
1.17	SRCK62xxCCxx cable assembly

WEARING THE HEADSET

FIGURE 2

#	Description
2.1	Headset
2.2	Boom microphone
2.3	Inline PTT
2.4	Two-way radio

The SM1P-Ex headset is designed to be worn with the headset sealing around the ears. Specific examples of how to fit the headset around the ears are covered in the next three pages. The fit does alter slightly depending on what style of brace is used - Headband, Behind-the-Neck, or Helmet mounted.

The boom microphone should be placed approximately 5mm (1/4") in front of the mouth. Check to ensure the white dot or microphone label is facing towards you. The orientation is essential as the microphone is directional. If the microphone faces a different direction, this may lead to a reduction in transmission quality.
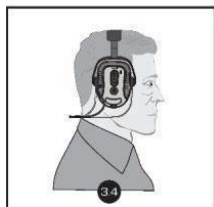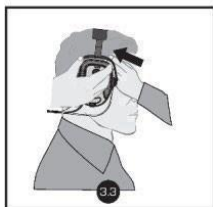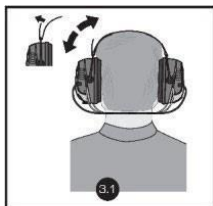
The inline PTT has a rotatable clip behind it to allow it to attach to the shirt / upper garment. The inline PTT must be connected to the two-way radio using the multi-pin connector.

FITTING THE HEADSET

It is recommended that the wearer should ensure that:

- The earmuffs are fitted, adjusted, and maintained in accordance with the manufacturer's instructions
- The earmuffs are always worn in high noise conditions

If the above recommendations are not adhered to, the protection afforded by the earmuffs will be severely impaired.
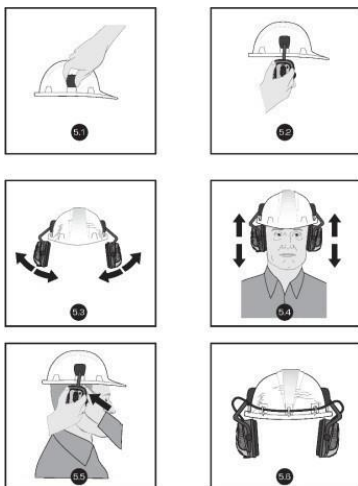
BEHIND-THE-NECK MOUNT FITTING INSTRUCTIONS

#	Description
3.1	Adjust Velcro strap so that the earmuff cups completely enclose the ears
3.2	The earmuff cushions should seal firmly against the head
3.3	For best results, remove all hair from under the ear cushion
3.4	Noise reduction will be adversely affected by anything that breaks the seal of the earmuff ear cushions

HEADBAND MOUNT FITTING INSTRUCTIONS

#	Description
4.1	Adjust the headband by pulling the center band out equally on both sides
4.2	Ensure no hair is inside the muff ear cushions
4.3	Fit the earmuffs over the ears ensuring a tight fit around the ears
4.4	Ensure the muff surrounds the ears
4.5	Press down on the headband to obtain a snug and comfortable fit

HELMET MOUNT FITTING INSTRUCTIONS

#	Description
5.1	Attach the adaptors to each side of the helmet by sliding them into the slots
5.2	Attach the earmuffs by sliding into the adaptors
5.3	Ensure the earmuff is firmly attached by lifting the arm up and down
5.4	Place the helmet on the head and adjust by sliding the earmuffs up and down
5.5	Earmuffs should seal firmly against the head. For best results, remove hair from under the earmuffs.
5.6	Three adhesive mounts and ties are included to secure the earmuff cable to the helmet. The mounts should be evenly spaced around the rear outside of the helmet. Fit the tie through the mount. The cable should feed through each tie and secured in place.

DUAL PROTECTION FITTING INSTRUCTIONS
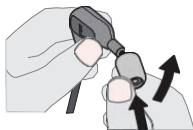

Locate the ear buds inside the ear cup.

Place earmuff away from the ears while fitting the ear buds. Insert ear tips following the ear tip fitting instructions on next page.
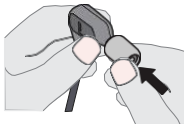

Place the earmuff back over the ears. Ensure the retractable, coiled cable is fully located within the ear cup. Noise reduction will be adversely affected by anything that breaks the seal of the earmuff cushions.
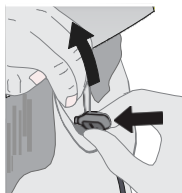
FOAM EAR TIP FITTING INSTRUCTIONS

Ensure hands and foam tips are clean before insertion. Place foam tip at an angle to plastic canal

Push the ear tip firmly over the plastic canal

Compress the foam to form a cylindrical shape being careful not to crease the foam

Gently pull your ear up and backwards with one hand while inserting the ear plug into the ear. Foam ear tips should be inserted within 5 seconds of compressing the foam. Make sure the plug seals well into the ear canal. The ear tip should not protrude out of the ear canal. If using foam ear tips hold the plug-in place for 20 seconds or until the foam has fully expanded.

OPERATING THE HEADSET

POWER ON:
1. Press and release the "Power" button shown in Figure 1.
2. All the LEDs will turn on briefly, & an audible sound will be heard through the headset.
3. The Green LED will flash at a normal rate as described below.

POWER OFF:
1. Press and hold the "Power" button for 2 seconds.
2. All the LEDs will turn on briefly and an audible sound will be heard through the headset as the headset powers off.

SENS° MODE:

When the headset is powered up, the unit is set into 'SENS' mode'.
By pressing the power button, this toggles 'SENS' mode'.
'SENS' mode' allows full situational awareness of your surroundings in addition to two-way radio, Bluetooth®, Short-Range, or face-to-face communications.

- The power button toggles between Quiet mode and SENS' mode

- The volume control buttons can be used to raise or lower the audio level of the SENS' mode

- **The default mode on power up can be programmed using the Sensear app

QUIET MODE:

By pressing the power button, this toggles 'Quiet mode'. Quiet mode only allows audio from communication devices to pass through the headset.

| SENS' mode | Green LED, blink twice every 4 seconds |
| Quiet mode | Green LED, blink once every 4 seconds |

SETUP MODE:

Setup mode enables a limited number of settings to be changed directly via the headset. This mode is separate from the normal headset operating mode. Some options will not be available if the product model does not support a feature or headset programming has removed the setup mode option. For further setup, a programming tablet will be required.

The options (with fully available feature set) are:

1. Short-Range – region
2. Short-Range – channel frequencies
3. FM Radio – enable/disable
4. VOX – feature assignment
5. VOX – trigger level

A short press and release of the power button will cycle through these options when in setup mode.

Enter/Exit Setup Mode:

1. Headset is powered off
2. Hold Volume Up button
3. While holding Volume Up, Press & release Power button
4. Will hear "system setup"
5. Release Volume Up button

The headset needs to be powered down before it can be powered up into its normal operating mode. Changes will be saved upon powering off the headset from setup mode.

(short)	Cycle down through system setup options
(long)	Power off the headset.

Changing Short-Range Region: Ensure you hear "Short-Range FM region".

+ / **−** (short)	Increment/decrement through regions 1, 2 or 3.

Region	EIRP (uW)	Standards	FM frequency range (MHz)
1	8.02	AS/NZS 4268	88.1 – 107.9
2	0.048	EN301357- 1	88.1 – 107.9
3	0.012	FCC-15.239/ICRSS-210	88.1 – 97.0

Set Short-Range FM Region

NOTE: Please use the FM frequency range allowed for your region as follows:

Region 1 for Australia/New Zealand

Region 2 for Europe

Region 3 for USA/Canada

Changing Short-Range Frequencies: Ensure you hear "Short-Range FM frequency".

➕ / ➖ (short)	**Change frequency:** up = increment 0.1MHz, down=decrement0.1MHz
➕ / ➖ (long)	**Change bank:** up = increment bank, down=decrement bank

Note, frequency range is 88.1MHz to 107.9MHz (97.0MHz for region 3).

The frequency/bank last selected in the setup mode will be the frequency/bank used when Short-Range is turned on in normal operating mode.

Changing FM Radio Enable: Ensure you hear "FM radio".

➕ / ➖ (short)	Toggle between "enable" and "disable".

Changing VOX Assignment: Ensure you hear "VOX setup".

➕ / ➖ (short)	Toggle between "disable" and "Short-Range"

Changing VOX Trigger Level: Ensure you hear "VOX level".

➕ / ➖ (short)	Cycle through "low", "medium" and "high" trigger levels

"low" is the most sensitive/easiest to trigger VOX and "high" is the least sensitive/hardest to trigger VOX.

COMMUNICATING

COMMUNICATING OVER TWO-WAY RADIO:

Only approved two-way radio cables (SRCK61xxCCxx) or adaptor cables (SRCK62xxCCxx) containing a certified IS barrier may be used with SM1P-Ex and SM1P-ExDP models.

To Transmit Over Two-Way Radio:

- Press and hold the button located on the inline PTT
- Release the inline PTT button to cease transmission
- To change the volume of the two-way radio communications, use the two-way radio's volume controls

NOTE:
- When the headset is powered off (and disconnected from the inline PTT), the inline PTT button may not activate the two-way radio. The PTT located on the two-way radio should be used.
- When the headset is powered on, the two-way radio PTT may not activate the two-way radio
- Audio will revert to radio when the headset connector is disconnected (dependent on radio type and compatible SRCK radio cable)

Two-Way Radio VOX: VOX can be used on VOX-enabled two-way radios. Refer to the two-way radio documentation for the setup and use of the VOX feature. To disable VOX, you can either turn VOX off on the two-way radio or press the headset PTT once, depending on which two-way radio model you use.

COMMUNICATING OVER SHORT-RANGE:

 + (short press) together to toggle Short-Range on / off.

When on:

	Short-Range PTT
/ (long)	Increment/decrement preset frequency bank

When the headset is powered off it remembers the last selected frequency bank and the Short-Range on/off state.

Short-Range VOX: [See Operating the Headset - Setup Mode section for VOX setup information]

If VOX is assigned to Short-Range, when Short-Range turns on, you will hear the Short-Range frequency announcement and then "VOX on". VOX can be toggled on and off:

+ (short)	Toggle VOX on and off (while Short-Range is turned on)

VOX does not trigger while there is an active signal on the Short-Range frequency. A VOX transmission can be interrupted by pressing and releasing the Short-Range PTT (i.e., MFB).

VOX will also not trigger when two-way is transmitting, Bluetooth® is in a phone call, or when connected to a Bluetooth® radio.

LISTENING TO FM RADIO:

 + (short press) together to toggle FM radio on /off. Note, FM radio cannot be turned on while Short-Range is turned on and vice versa.

When on:

/ (long)	Scan up/down to the next FM radio.

When a Bluetooth® phone call is entered, FM radio audio is muted. It will return when the call ends.

When the headset is powered off it remembers the last tuned FM radio frequency and the FM radio on/off state.

COMMUNICATING OVER BLUETOOTH®:

First Time Pairing: Press and hold the multi-function button (MFB) to put the headset into pairing mode. "Bluetooth® discoverable" when pairing mode is entered. Will hear a connection tone if connection successful. Pairing mode times out after 2 minutes.

NOTE: If Short-Range is turned on, you must first turn it off to use the MFB for Bluetooth® pairing (see Short-Range section). After the headset is in Bluetooth® pairing mode, Short-Range can be turned back on.

Reconnect: When powered on the headset will try to reconnect to the last paired device. Alternatively, if the headset is not currently paired to another device, prompt the reconnection from a device (e.g., mobile phone that has the headset stored in its device list).

Incoming call	Answer call:
	a. From handset
	b. Press and release multi-function button
	Reject call:
	a. From handset
	b. Press and hold multi-function button
During call	End call:
	a. From handset
	b. Press and hold multi-function button
	c. Call hung up on the far end

Two-Way Radio Bluetooth®: To transmit, use the radio's PTT. For some select device, MFB will perform as a Bluetooth® PTT (if Short-Range off).

Contact a Sensear representative for compatible devices.

Bluetooth® Phone Call: During a Bluetooth® phone call, if two-way radio or Short-Range are transmitting, outgoing Bluetooth® is muted while incoming audio is still heard. Once two-way and Short-Range stop transmitting, outgoing Bluetooth® is restored.

Bluetooth® Audio Streaming: Audio streaming can **only** be used in **Quiet mode**. Streamed audio will be mute in SENS' mode. This is often used for streaming music, but industrial use cases include Bluetooth® machine health analyzers.

Blue LED Indicator:

Solid	Paring mode
Blinking slowly	Paired
Blinking fast	Incoming phone call

USER MAINTENANCE AND STORAGE

This product may be adversely affected by certain chemical substances. Further information should be sought from the manufacturer.

The headset contains replaceable cushions (Part #: SMHK0006 or SMHK0005). Cushions are recommended to be replaced every 3-6 months to maintain the appropriate hearing protection that the product is certified to. Cushions should be inspected regularly for signs of damage or wear. Cushions can be removed simply by gripping the cushion and pulling firmly to unclip from the baseplate. Replacement cushions may be pushed into the clips around the baseplate.

The headset should be stored at room temperature (between 15°C/59°F and 25°C/77°F).

ACCESSORIES AND SPARE PARTS

The following accessories and spare parts may be ordered separately:

SRCK61xxCCxx SRCK62xxCCxx	**Intrinsically Safe** Two-Way Radio Interface Cables for Most Popular Two-Way Radios
SMHK0006	Earmuff Hygiene Kits
SMHK0005	Dual Protection Hygiene Kits
SMBE0000	Behind-the-Neck Replacement Band
SMBB0000	Headband Replacement Band
SMMK0002	Smart Muff Helmet Mount Replacement
SMHA0000	SM1 Helmet Adaptor – 3718
SMHA0001	SM1 Helmet Adaptor – 3713
SMHA0002	SM1 Helmet Adaptor – 3714
SMBM0003	Ex Replacement Boom Microphone
SMBM0002	Replacement Throat Microphone
MFP00062B	Dual Protection Replacement Earbud Pair
SMAP0000	Absorbent Pads x5 Pair
SMWS0001	Smart Muff Wind Protector Kit
SMBMHK01	Smart Muff Boom Microphone Wind Sock x5
SMPW0001	Wall Charger 5.5V 1.0A
PRGTAB01	Programming Tablet

Further information may be obtained from your Sensear representative, via the Sensear web site, or by emailing or writing to the address on this User Manual.

CHARGING

The headset is supplied with an AC adapter that operates globally when fitted with the appropriate electrical regional adapter. Charging must only be performed in the safe area.

To charge the headset, follow the steps below:

1.   Plug the Sensear AC adapter into an appropriate power outlet. The socket must be easily accessible.

2.   Insert the cable end of the Sensear AC adapter into the DC power socket on the SM1P-Ex headset (located on the left-hand-side of the unit).

3.   The LEDs will flash as indicated below:

Red LED (LHS) blink twice every 5 seconds	Battery low (<1 hour left)
Red LED (LHS) solid	Charging
Green LED (LHS) solid	Charge complete

NOTE: When the DC plug is inserted into the headset, the headset will be in a charge-only state. Other operating features will not be useable.

TECHNICAL SPECIFICATIONS

	Headband	Behind-the-Neck	Helmet Mount
Weight	495g (17.46 oz.)	428g (15.09 oz.)	480g (16.93 oz.)
Operating temperature	Non-Hazardous Environments: -20ºC to +60ºC (-4ºF to 140ºF) II 2G Ex ib IIC T4Gb (-20ºC ≤ Ta ≤ +40ºC) II 2D Ex ib IIIC T155ºC Db (-20ºC ≤ Ta ≤ +40ºC) I M2Ex ib I Mb (-20ºC ≤ Ta ≤ +60ºC) Cl I, Div 1 Grp A-D, T4 (-20ºC ≤ Ta ≤ +40ºC) Cl I, Zn1, AEx ib IIC T4 Gb (-20ºC ≤ Ta ≤ +40ºC) Cl I, Zn21, AEx ib IIIC T155ºC Db (-20ºC ≤ Ta ≤ +40ºC) Check the product label to identify the ratings applicable to the headset.		
Charging temperature	0ºC to +40ºC (32ºF to 104ºF)		
Battery charge time	4 hours		
Operating time	18-24 hours		

SENSEAR STANDARD WARRANTY TERMS & CONDITIONS

Sensear Pty Ltd ("SENSEAR") warrants the SENSEAR manufactured HEARING PROTECTION products ("Product") listed below to be free from defects in material and workmanship under normal use and service for a period of 12 months from the original date of purchase.

SENSEAR will at its absolute discretion repair or replace the Product where a defect in material or workmanship occurs, at no charge to the end user for parts or labor. SENSEAR reserves the right to replace the Product with the same or equivalent part or Product rather than repair it. Where a part or Product is replaced, the part or Product becomes the property of SENSEAR. SENSEAR reserves the right to use refurbished parts or Product for repair or replacement.

SENSEAR is not responsible for any damage caused to or by accessory or ancillary equipment connected or attached to the Product that is not provided by SENSEAR and is not expressly designed to operate in conjunction with the Product.

This warranty is not assignable or transferable to any other party, this warranty is extended to the original purchaser of the Product only.

This warranty is in addition to your statutory rights provided under the Trade Practices Act, or relevant legislation in your state or territory.

SENSEAR reserves the right to limit its liability to the repair, replacement, or refund of the purchase price of a Product. Under no event shall SENSEAR be liable for damages more than the original purchase price of the Product, for any loss of use, loss of time, inconvenience, loss of profits or savings, loss of revenue, commercial loss, or any other incidental, special, or consequential loss to the full extent such may be disclaimed by the law.

This warranty does not cover:

- Defect or damage resulting from use of the Product in other than its normal or intended manner.
- Defects or damage occurring from misuse, abuse, accident, corrosion, fire, liquid intrusion, or neglect, including during transportation.
- Defects or damage occurred from improper or unauthorized testing, operation, maintenance, service, repair, alteration, modification, or adjustment.
- Freight costs to the place of repair.
- Product that has been subjected to unauthorized or illegal alteration of the firmware or software in the Product.
- Cosmetic damage to the Product that does not interfere with the intended operation of the Product.
- Normal wear and tear.
- Product where the serial number has been removed or altered.
- Any batteries rechargeable or otherwise either shipped with or internal to the Product.
- Any consumable items, for example replaceable ear-tips or ear-cup pads.
- Warranty claims made outside of the warranty period.
- Warranty claims made without appropriate proof of purchase bearing both the original purchase price and date.
- All other warranties, conditions, terms, representations, and undertakings whether express or implied.

How to Get Warranty Service

To register your product visit: sensear.com/support/headset-registration

If you require warranty service visit: sensear.com/support/returns-repairs-new

TROUBLESHOOTING

1. If Bluetooth® is not pairing to your device, first check to see if Short-Range is turned on. You must first turn it off to use the MFB for Bluetooth® pairing (see Short-Range section). After the headset is in Bluetooth® pairing mode, Short-Range can be turned back on.
2. If the two-way radio audio is not clear or distorted, or the headset cuts out:
   - Adjust the two-way radio volume at the two-way radio controls. Setting a volume level of 50% is a good starting point.
   - Check that the battery in the two-way radio is charged.
3. If you cannot hear any of the surrounding environment:
   - The headset may be in 'Quiet mode,' or power is not present to the headset. Press the power button on the headset to toggle between Quiet mode and SENS˙ mode
4. If the receiver cannot hear your voice and you can only hear the background noise:
   - Refer to the 'Wearing the headset' chapter of the manual. Ensure that your boom microphone is set up appropriately.

SM1P-Ex

TECHNICAL INFORMATION

Rev: 09/07/23

For most recent technical information, visit
www.sensear.com/support/technical-information

FORWARD

Product Safety and RF Exposure Compliance:

This product is designed to be used in isolation or in conjunction with a two-way radio. Before using this product with a two-way radio, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet enclosed with the two-way radio.

FCC COMPLIANCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

FCC ID: XKS-SM1xSR   IC: 8376A-SM1XSR
FCC ID: QOQWT32I   IC: 5123A BGTWT32I

TECHNICAL SPECIFICATIONS

	Headband	Behind-the-Neck	Helmet Mount
Weight	495g (17.46 oz.)	428g (15.09 oz.)	480g (16.93 oz.)
Operating temperature	-20°C to +60°C (-4°F to 140°F)		
Charing temperature	0°C to +40°C (32°F to 104°F)		

	Non-Intrinsically Safe	Intrinsically Safe
Battery type	2650 mAh Lithium Polymer, rechargeable	2250 mAh Lithium-ion, rechargeable
Battery charge time	7 hours	4 hours
Operating time	24 hours	18-24 hours
Housing Material	PP, ABS + TPE	
RoHS Compliant	Yes	

NRR AND SLC80

The SM1P-Ex has been certified to international hearing protection standards including AS/NZS 1270:2002, ANSI S3.19-1974, ANSI S12.6-2008, EN352-1, EN352-3, EN352-4, and EN352-6.

The following passive attenuation ratings were observed:

PASSIVE ATTENUATION (ANSI S3.19-1974)

SM1P-Ex measured in accordance with ANSI S3.19 -1974.

Headband mount- SM1PBEXxx

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR
Mean attenuation (dB)	22.1	24.4	31.1	35.1	35.8	37.0	39.9	40.7	40.7	27 dB
Standard deviation(dB)	3.1	2.4	2.0	2.5	3.2	3.0	3.3	2.7	2.9	

Behind-the-Neck mount-SM1PEXxx

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR
Mean attenuation (dB)	18.9	22.4	28.6	33.6	33.5	35.3	37.3	38.8	37.4	24 dB
Standard deviation(dB)	3.5	3.4	2.6	2.8	2.3	3.5	4.0	2.9	3.4	

Helmet mount - SM1PHEXxx

Frequency (Hz)	125	250	500	1000	2000	3150	4000	6300	8000	NRR
Mean attenuation (dB)	18.6	20.8	27.3	33.6	37.1	35.5	35.3	37.1	35.0	23 dB
Standard deviation(dB)	3.2	2.7	3.1	3.9	2.3	3.1	3.8	3.8	3.4	

PASSIVE ATTENUATION (ANSI S12.6–2008)

SM1P-Ex measured in accordance with ANSI S12.6 - 2008.

Headband mount- SM1PBEXxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	NRR(SF)
Mean attenuation (dB)	21.4	21.9	29.8	33.7	35.8	37.2	38.5	27 dB
Standard deviation(dB)	3.0	2.1	1.7	2.8	1.5	1.9	2.8	
APV80	18.9	20.1	28.4	31.3	34.5	35.6	36.1	

Behind-the-Neck mount-SM1PEXxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	NRR(SF)
Mean attenuation (dB)	18.7	19.9	28.0	34.1	31.5	35.6	35.3	24.3 dB
Standard deviation(dB)	3.0	2.5	2.2	1.7	3.2	3.4	4.1	
APV80	16.2	17.8	26.2	32.7	28.8	32.7	31.9	

Helmet mount - SM1PHEXxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	NRR(SF)
Mean attenuation (dB)	15.0	17.7	25.2	30.4	33.9	34.5	33.8	19.1 dB
Standard deviation(dB)	6.5	6.7	6.6	4.0	3.3	5.9	5.1	
APV80	9.5	12.1	19.7	27.0	31.1	29.5	29.5	

PASSIVE ATTENUATION (AS/NZS 1270:2002)

SM1P-Ex measured in accordance with AS/NZS 1270:2002.

Headband mount - SM1PBEXxxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	SLC (80)
Mean attenuation(dB)	20.3	21.7	30.3	33.2	35.2	36.6	37.3	31dB, Class 5
Standard deviation(dB)	4.3	3.1	2.7	3.0	2.7	2.5	3.3	
Mean atten. – Standard dev. (dB)	16.0	18.6	27.6	30.2	32.5	34.1	34.0	

Behind-the-Neck mount - SM1PEXxxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	SLC (80)
Mean attenuation(dB)	19.3	20.0	27.0	33.7	30.5	33.9	33.0	27 dB, Class 5
Standard deviation(dB)	5.1	4.1	3.7	2.4	4.5	3.8	5.2	
Mean atten. – Standard dev. (dB)	14.2	15.9	23.3	31.3	26.0	30.1	27.8	

Helmet mount - SM1PHEXxxx

Frequency (Hz)	125	250	500	1000	2000	4000	8000	SLC (80)
Mean attenuation(dB)	15.6	19.1	24.7	29.7	34.0	34.5	33.4	26 dB, Class 5
Standard deviation(dB)	5.7	5.5	5.2	3.9	3.0	5.5	5.0	
Mean atten. – Standard dev. (dB)	9.9	13.6	19.5	25.8	31.0	29.0	28.4	

PASSIVE ATTENUATION (EN352-1 AND EN352-3)

SM1P-Ex measured in accordance with EN352-1 and EN352-3.

Headband mount- SM1PBEXxx (EN352-1)

Frequency (Hz)	125	250	500	1000	2000	4000	8000	H	M	L	SNR
										(dB)	
Mean attenuation (dB)	22.	24.5	31.5	34.9	35.8	38.0	39.8				
Standard deviation (dB)	4.8	2.6	2.3	3.1	2.5	2.1	2.7	35	30	24	33
Mean attenuation – Standard deviation (dB)	17.	21.9	29.2	31.8	33.3	35.9	37.1				

Behind-the-Neck mount- SM1PEXxx (EN352-1)

Frequency (Hz)	125	250	500	1000	2000	4000	8000	H	M	L	SNR
										(dB)	
Mean attenuation (dB)	20.	21.3	27.7	34.0	33.3	35.3	36.1				
Standard deviation (dB)	5.1	3.3	3.1	2.5	2.9	2.3	2.6	32	27	21	30
Mean attenuation – Standard deviation (dB)	15.	18.0	24.6	31.5	30.4	33.0	33.5				

Helmet mount- SM1PHEXxx (EN352-3)

Frequency (Hz)	125	250	500	1000	2000	4000	8000	H	M	L	SNR
										(dB)	
Mean attenuation (dB)	20.	22.2	28.2	33.5	36.9	38.0	37.5				
Standard deviation (dB)	3.6	3.3	3.3	3.6	2.3	3.9	3.0	34	28	22	31
Mean attenuation – Standard deviation (dB)	16.	18.8	24.9	29.8	34.6	34.1	34.6				

The SM1P-Ex has level dependent facilities and the criterion levels as defined in EN352-4 are displayed below:

Model	H	M	L
	dB(A)		
SM1P-Ex	108.6	104.6	103.4

TWO-WAY RADIO INPUT (EN352-6)

	NRR ANSI S3.19-1974 US	SLC [80] AS/NZS 1270:2002 Australia	SNR EN352-1 and EN352-3 EU	NRR[SF] ANSI S12.6–2008 US & Canada
	Foam	Foam	Foam	Foam
Headband	30dB	32dB, Class 5	37dB	33dB
Behind-the-Neck	31dB	33dB, Class 5	38dB	33dB
Helmet	29dB	30dB, Class 5	38dB	31dB

TWO-WAY RADIO INPUT (EN352-6)

The electrical input level for which the mean plus one standard deviation is A-weighted diffused-field related sound pressure level is equal to 82 dB(A) is an RMS voltage U = 108mV.

SIZE RANGES

WARNING Earmuffs complying with EN352-1 are of 'small size range', 'Medium size range' or 'large size range'. 'Medium size range' earmuffs will fit most wearers. 'Small size range' or 'large size range' earmuffs are designed to fit wearers for whom 'medium size range' earmuffs are not suitable. The SM1P-Ex headband, SM1P-Ex behind-the-neck, and SM1P-Ex helmet adapters may be adjusted for small, medium, or large size.

MAINTENANCE AND CLEANING

The headset is an active hearing protector that allows audible contact with your surroundings while providing protection from harmful noise.

It is recommended that the headset is fitted, adjusted, and maintained in accordance with these instructions. This headset should always be worn in noisy surroundings. The headset should be regularly inspected for serviceability.

Warning:

- If these instructions are not followed the protection of the headset will be severely impaired.
- Noise reduction will be adversely affected by anything that impairs the seal of the earmuff cushions against the head, such as thick spectacle frames and balaclavas
- The reported attenuation will be obtained only if the headset is in good condition and worn as directed (Refer to AS/NZS 1269.3 for guidance).
- This product should not be used where there is a risk that the connecting cord could be caught up during use.
- This product is provided with level-dependent in-ear audio playback. The wearer should check correct operation before use. If distortion, or failure is detected. The wearer should refer to the manufacturer's advice for maintenance and/or replacement.

Warning:

- Performance may deteriorate with battery usage. The typical period of continuous use that can be expected from the headset will depend on the two-way radio battery.
- The output of the level-dependent circuit of this hearing protector may exceed the daily limit sound level. This limit can be adjusted with a Sensear programming tablet.
- This headset has been tested and approved according to the methods described in the EN352 series of standards.

CLAMPING FORCE

The clamping force of the SM1P-Ex has been measured in accordance with AS/NZS 1270

Model	Part #	Units	Initial measurements			Post-flex measurements		
			A	B	C	A	B	C
SM1P-Ex-Headband mount	SM1PBXXX & SM1BBXXX	Newtons (N)	11.6	11.1	11.1	11.1	10.7	11.1
		Pounds (lbs)	2.6	2.5	2.5	2.5	2.4	2.5
SM1P-Ex-Behind-the-Neck mount	SM1PEXXX & SM1BEXXX	N	14.2	14.7	14.2	14.2	14.7	14.2
		lbs	3.2	3.3	3.2	3.2	3.3	3.2
SM1P-Ex-Helmet mount	SM1PHXXX & SM1BHXXX	N	9.3	9.3	9.3	9.3	8.9	9.3

INTRINSICALLY SAFE CERTIFICATION – Ex MODEL

The SM1P-Ex meets the following international standards for use in explosive gas environments:

II 2G Ex ib IIC T4Gb(-20℃ ≤ Ta ≤ +40℃)
II 2D Ex ibIIIC T155℃ Db (-20℃ ≤ Ta ≤ +40℃)
I M2Ex ibI Mb(-20℃ ≤ Ta ≤ +60℃)
Cl I, Div 1GrpA-D, T4 (-20℃ ≤ Ta ≤ +40℃)
Cl I, Zn1, AEx ib IIC T4Gb(-20℃ ≤ Ta ≤ +40℃)
Cl II, Zn21, AEx ib IIIC T155℃ Db (-20℃ ≤ Ta ≤ +40℃)

MARKINGS

The SM1P-Ex contains the following markings:
Hazardous location class and group and temperature class

Where "XXXX" is the number of the ATEX Notified Body responsible for the ATEX QAN.

ENTITY PARAMETERS

The following entity parameters are for whenSM1P-Ex is used with SRCK61xxCCxx or SRCK62xxCCxx at the radio or intrinsically safe device end of the interface cable.

Entity Parameter	Value
U_i/Vmax	9V
C_i	0.09μF
L_i	0μH
Ii	2.22A
Pi	1.3W

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