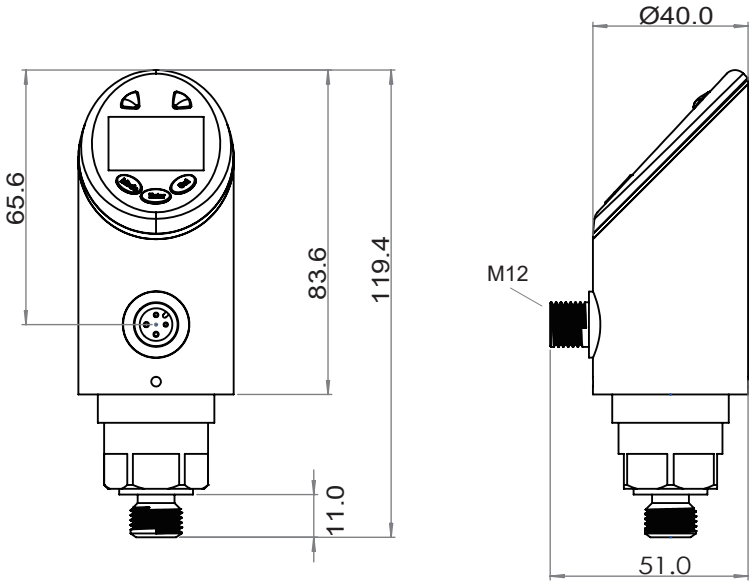
# IO-Link sensor

## SEH-C2-1/4GA-LI6D-SC Pressure sensor with display



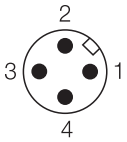



- IO-Link Smart Pressure Sensor
- 4-digit large digital tube display, mirroring, semi-transparent design
- The upper part of the housing can be rotated 300°
- Normally open/normally closed, PNP/NPN/push-pull, hysteresis/window configurable
- Switching signal /analog signal, switching signal /IO-Link can be set
- The display panel adopts an integrated housing
- The main body of the housing is made of stainless steel
- The interface is M12 A code 4-pin
- Key lock function, simple key menu operation
- Sensor parameters can be set via buttons and IO-Link
- The starting and ending points of the analog signal can be set

| Model | SEH-C2-1/4GA-LI6D-SC |
|---|---|
| Working/load voltage | 24VDC ± 10% |
| Module operating current | < 200mA |
| Pressure parameters | |
| Measuring range | 0-100 bar (0-10Mpa) |
| Max overvoltage | 200 bar |
| Interface type | M12 A code 4-pin |
| Accuracy | 0.5% |
| Output parameters | |
| OUT1 Signal | Switching signal or IO-Link (automatic wake-up) |
| OUT2 Signal | Switching signal or 4-20mA or 20-4mA |
| Switching signal output type | NPN/PNP/Push-Pull, NO/NC, Hysteresis/Window programmable |
| Switching signal output current | 250mA |
| Switch point SP setting range | 0.5 bar - 100bar |
| Release point rP setting range | 0 bar- 99.5bar |
| Minimum interval between SP and rP points | 0.5 bar (0.5%F.S*) |
| Switching signal output resolution | 0.1 bar |
| Analog signal output maximum load | 500Ω |
| Analog signal output accuracy | 0.5%F.S |
| Minimum interval between analog signal start and end points | 20 bar(20%F.S) |
| IO-Link | |
| Vendor ID | 1317 (0x0525) |
| Device ID | 198673(0x030811) |
| Number of interfaces | 1 |
| IO-Link protocol version | V1.1 |
| IO-Link input bytes | 2 bytes (16Bit) |
| Frame type | TYPE_2_2 |
| Transmission rate | COM2 38.4kbit/s |
| Minimum cycle time | 2400us |
| ISDU(Indexing Service) | Support |
| Block parameter operations | Not support |
| Data storage(DS) | Not support |
| Working temperature | -40 - 80℃ |
| Protection level | IP65 |

* F.S: Full scale of measuring range (for example, measuring range -1-6Bar, then F.S=7)

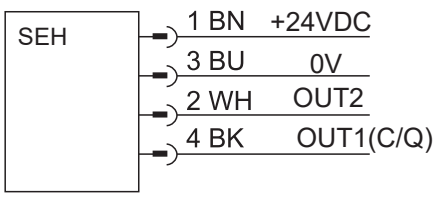
## IO-Link M12 interface




1 = +24VDC
2 = OUT2
3 = 0V
4 = OUT1(C/Q)

Note: OUT1: switching signal or IO-Link
OUT2: switching signal or analog signal

## Wiring diagram

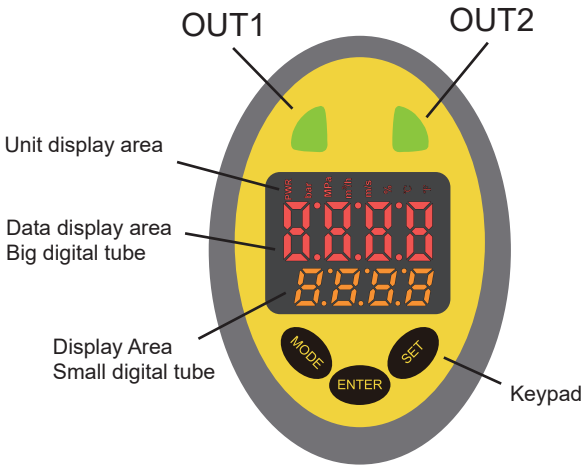


# User Manual

## Status Indicator

| | | |
|---|---|---|
| PWR | Red | On: Power supply is normal;<br>Off: Power supply is abnormal;<br>Flashing: IO-Link is communicating normally |
| bar MPa | Red | On: Represents the unit of the current digital tube display data<br>Off: Not the current unit |
| OUT1 OUT2 | Green | On: Enable output on the corresponding digital signal pin<br>Off: Disable output on the corresponding digital signal pin<br>Note:This LED indicates the output status and is not an alarm light |
| Big digital tube | Red | Displays the sensor pressure measurement data<br>"- - - -" is displayed to indicate invalid data |
| Small digital tube | Orange | DisplayLocIndicates that the key lock is turned on |

Note: The display area adopts a semi-transparent design,It can be seen when the LED is on, but not when it is off; other unused units are not visible on the sensor.




Enlarged view of unit display area

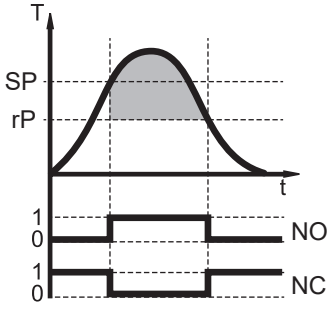



## IO-Link process data mapping

| *BYTE* | BYTE0 | | | | | | | | BYTE1 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *BIT* | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| *DATA* | Pbit13 | Pbit12 | Pbit11 | Pbit10 | Pbit9 | Pbit8 | Pbit7 | Pbit6 | Pbit5 | Pbit4 | Pbit3 | Pbit2 | Pbit1 | Pbit0 | OUT2 | OUT1 |

Note: Pbit represents 14-bit pressure data. Pressure data is a signed number in bar, ranging from 0 to 1000, which means the actual pressure is magnified 10 times.
OUT1 and OUT2 represent the pressure output status; use the right shift instruction to remove OUT1 and OUT2 to obtain 14-bit pressure data

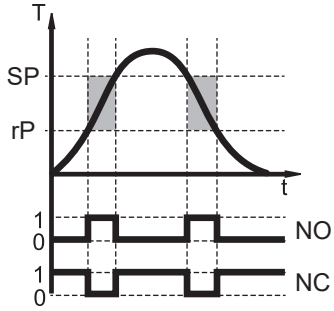
## Description of switching signal data and analog signal data output




### Hysteresis Mode

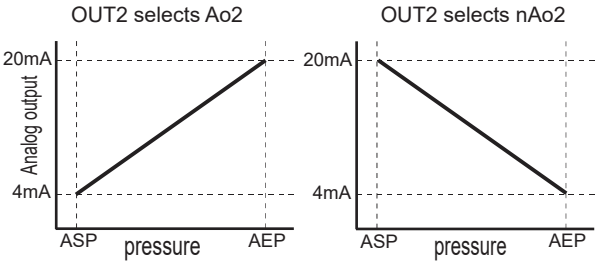
This ensures a stable switching state, independent of temperature fluctuations affecting the set point.

The switching range can be set by the user via the switch point (SP) and release point (rP)




### Windowed Mode

Determine whether the temperature is within a specific range (window), and trigger the output switch under the corresponding conditions to generate an alarm signal.
The switch range can be set by the user through the upper window limit (SP)
and the lower window limit (rP)




### Analog signal correspondence

When selecting analog output,
users can determine the corresponding relationship by setting the analog starting point (ASP)
and analog end point (AEP)
The minimum distance between ASP
and AEP is 20% F.S;
AEP should be larger than ASP;

Note: 1. When setting SP, it must be greater than rP. You can set the SP value first and then rP;If the set SP is less than rP, rP will drop to the maximum value allowed.
2. When setting AEP, it must be greater than ASP. You can set AEP first and then ASP;If the set AEP is less than ASP, ASP will drop to the maximum value allowed.

# User Manual

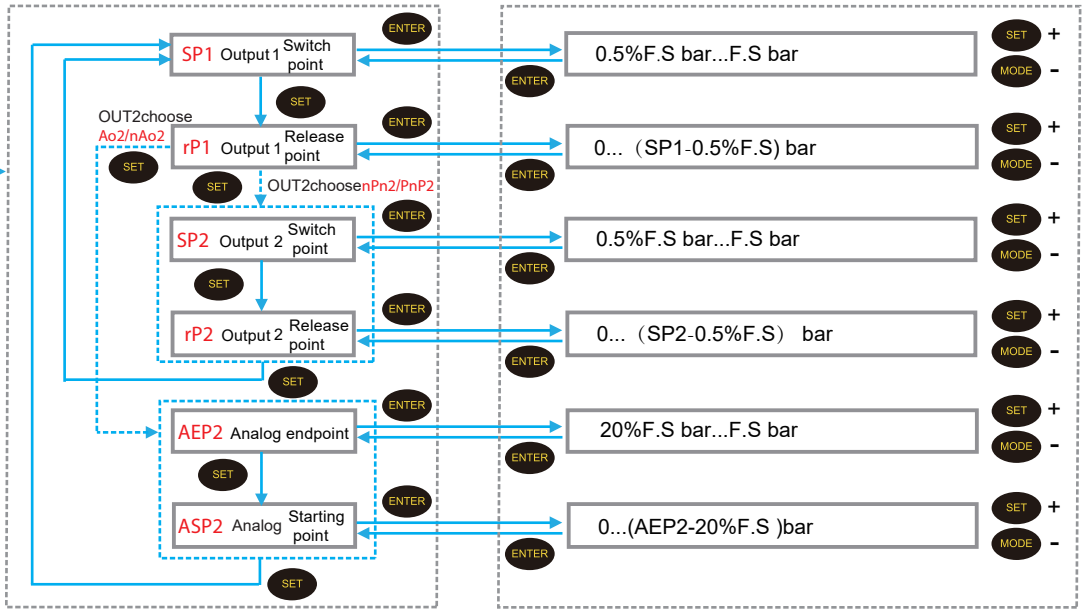
## Key Operation

### Simple menu operation




MODE >2s

MODE Return Save




#### Normal display mode

- In this mode, press the MODE button for more than 2 seconds to enter the first level menu
- In this mode, press the ENTER key + SET key simultaneously for more than 6 seconds to turn the key lock on or off. When turned on, the small digital tube display area will displayLoC, and it will switch back to temperature display after 2 seconds.

#### First level menu

- In this menu, press SET to switch options.
- Press MODE to return and save the parameters.
- Press ENTER to enter the next menu level

#### Second level menu

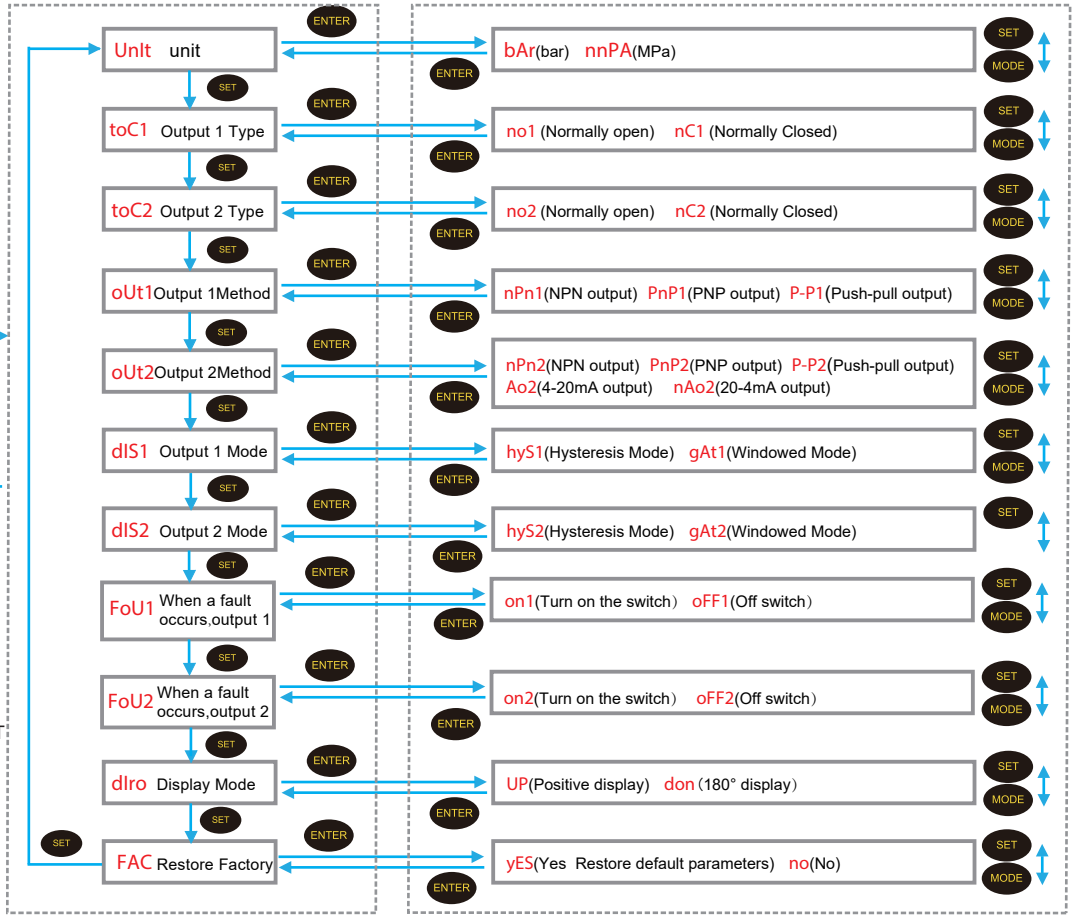
- Press the SET button to increase the setting value.
- Long press to increase the value.
  Press the MODE button to decrease the setting value.
  Long press to decrease the value.
- Press ENTER to confirm and return to the previous menu.
  Note: Confirmation does not mean saving

### Programming menu operation




MODE + SET >2s

MODE Return Save




#### Normal display mode

- In this mode, press the MODE and SET keys simultaneously for more than 2 seconds to enter the first level programming menu
- In this mode, press the ENTER key + SET key simultaneously for more than 6 seconds to turn the key lock on or off. When turned on, the small digital tube display area will displayLoC, and it will switch back to temperature display after 2 seconds.

#### First level menu

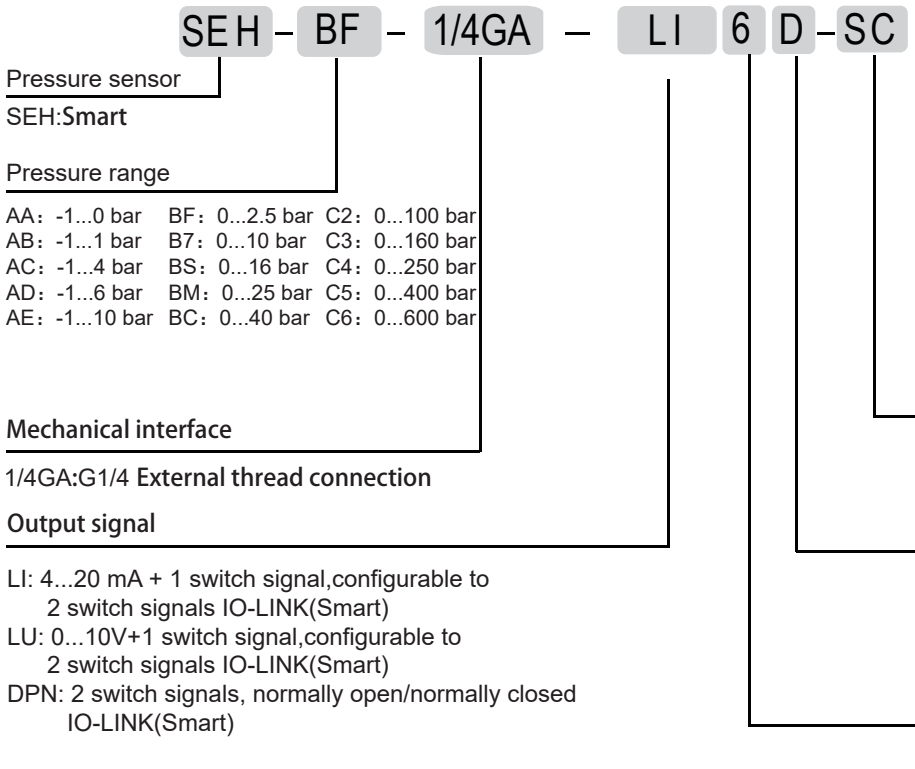
- In this menu, press SET to switch options.
- Press MODE to return and save the parameters.
- Press ENTER to enter the next menu level

#### Second level menu

- In this menu, press SET or MODE to switch options.
- Press ENTER to confirm the option and return to the previous level.

Note: After entering the simple or programming menu, if there is no key operation within 3.5 minutes, it will automatically return to the normal display mode without changing the setting parameters;
For the switch output mode, NPN controls the 0V switch, providing a low level without a high level; PNP controls the 24V switch, providing a high level without a low level;
P-P push-pull is a combination of NPN and PNP;

## Pressure sensor model naming rules




## FAC Default Parameters

| Parameter list | FAC Default Value |
|---|---|
| SP1 | 25%FS |
| rP1 | 23%FS |
| SP2 | 75%FS |
| rP2 | 73%FS |
| AEP2 | FS |
| ASP2 | 0 |
| UnIt | bar |
| toC1 | no1 |
| toC2 | no2 |
| oUt1 | PnP1 |
| oUt2 | PnP2 |
| dIS1 | hyS1 |
| dIS2 | hyS2 |
| FoU1 | oFF1 |
| FoU2 | oFF2 * |
| diro | UP |
| loc | 0:unlock |

* When[oUt2]selects analog signal output,
In case of an internal fault,
The output signal will run according to the parameter settings in[FoU2]

| | FoU2=ON | FoU2=OFF |
|---|---|---|
| [oUt2] =Ao2 | 20mA | 4mA |
| [oUt2] =nAo2 | 4mA | 20mA |

## IO-Link parameters

### Parameter data/ Request data/Indexing Service（ISDU indexed service data unit）

| Index | Subindex | Parameter name | length | Permissions | Describe |
|---|---|---|---|---|---|
| 0x02 2 | 0 | System Commands | 1Byte | Write | 0x80 128 Device reset 0x82 130 Factory reset |
| 0x10 16 | 0 | Manufacturer's name | 8Byte | Read | Sentinel |
| 0x11 17 | 0 | Manufacturer Description | 41Byte | Read | Sentinel Industrial Ethernet manufacturer |
| 0x12 18 | 0 | Product name | 17Byte | Read | SEH-xx-xxx-xxx-SC |
| 0x13 19 | 0 | Product ID | 8Byte | Read | 19867301 |
| 0x14 20 | 0 | Product Description | 23Byte | Read | Pressure sensor io-link |
| 0x15 21 | 0 | Serial-Number | 10Byte | Read | 1986730101 |
| 0x16 22 | 0 | Hardware version | 8Byte | Read | HW-V0.01 |
| 0x17 23 | 0 | Software version | 8Byte | Read | FW-V0.01 |
| 0x18 24 | 0 | Apply Tags | maximum 32Byte | Read Write | ApplicationSpecificTag is used to mark the device in the application This item is defined in the IODD file and is included in DataStorage(DS) |
| 0x19 25 | 0 | Function Label | maximum 32Byte | Read Write | FunctionTag is a special tag for device functions, including This item is not defined in the IODD file and can be set directly through Index |
| 0x1A 26 | 0 | Local Tags | maximum 32Byte | Read Write | LocationTag is a special tag used for local devices, including DS This item is not defined in the IODD file and can be set directly through Index |
| 0x24 36 | 0 | Device status | 1Byte | Read | 0:The device is operating normally; 1:Maintenance is required; 2:Incorrect operating environment or parameters; 3:The device is temporarily invalid; 4:The device fails to operate; |

| Index | Subindex | Parameter name | length | Permissions | Ranges |
|---|---|---|---|---|---|
| 0x1F4 500 | 0 | Unit | 1Byte | Read Write | 0: bar 1: Mpa |
| 0x1F5 501 | 0 | toC1 Output 1 Type | 1Byte | Read Write | 0: NO Normally open 1: NC Normally Closed |
| 0x1F6 502 | 0 | toC2 Output 2 Type | 1Byte | Read Write | 0: NO Normally open 1: NC Normally Closed |
| 0x1F7 503 | 0 | oUt1 Output 1 method | 1Byte | Read Write | 0: NPN output 1: PNP output 2: P-P push-pull output |
| 0x1F8 504 | 0 | oUt2 Output 2 method | 1Byte | Read Write | 0: NPN output 1: PNP output 2: P-P push-pull output 3: Ao (4-20mA) 4: nAo (20-4mA) |
| 0x1F9 505 | 0 | diS1 Output 1 Mode | 1Byte | Read Write | 0: hyS hysteresis mode 1: gAt window mode |
| 0x1FA 506 | 0 | diS2 Output 2 Mode | 1Byte | Read Write | 0: hyS hysteresis mode 1: gAt window mode |
| 0x1FB 507 | 0 | diro Display Mode | 1Byte | Read Write | 0: UP positive display 1: don180° display |
| 0x1FC 508 | 0 | Lock Key lock | 1Byte | Read Write | 0: Unlocked 1: Key locked |
| 0x1FD 509 | 0 | FoU1 When a fault occurs, output 1 | 1Byte | Read Write | 0: oFF1(Off switch） 1: on1(Turn on the switch） |
| 0x1FE 510 | 0 | FoU2 When a fault occurs, output 1 | 1Byte | Read Write | 0: oFF2(Off switch） 1: on2(Turn on the switch） |
| 0x258 600 | 0 | SP1 Output 1 Switch point | 2Byte | Read Write | 5 to 1000 Note: Unit bar SP1 should be greater than rP1 otherwise it will be rejected |
| 0x259 601 | 0 | rP1 Output 1 Release Point | 2Byte | Read Write | 0 to 995 Note: Unit: bar rP1 should be less than SP1 or it will be rejected |
| 0x25A 602 | 0 | SP2 Output 2 Switch point | 2Byte | Read Write | 5 to 1000 Note: Unit: bar SP2 should be greater than rP2 or it will be rejected |
| 0x25B 603 | 0 | rP2 Output 2 Release Point | 2Byte | Read Write | 0 to 995 Note: Unit: bar rP2 should be less than SP2 or it will be rejected |
| 0x25C 604 | 0 | ASP2 Analog starting point | 2Byte | Read Write | 0 to 800 Note: Unit: bar ASP2 should be smaller than AEP2 or it will be rejected |
| 0x25D 605 | 0 | AEP2 Analog endpoint | 2Byte | Read Write | 200 to 1000 Note: Unit bar AEP2 should be greater than ASP2 otherwise it will be rejected |

### Error code

32785 / 0x8011：Invalid index
32786 / 0x8012：Invalid subindex
32819 / 0x8033：The length of the written parameter exceeds the defined length
32820 / 0x8034：The length of the written parameter is less than the defined length
32816 / 0x8030：The written parameter exceeds the settable range