SJT-BRM3-V1 Composite Steel Belt Monitoring Device

Instruction Manual

Version： V1.2

Content

Chapter 1 Introduction

1.1 Functions principle

Bluelight steel strip monitoring device can be installed in elevators that use steel strip traction, and can continuously monitor the safety status of the steel core inside each steel strip. This device consists of three parts: a detection host, a steel strip head connector, and a steel strip end shorting connector. The entire steel core of each steel strip is connected in series through the head connector and end short connector, and electrical excitation is provided to monitor its electrical characteristics. The status of the steel core is monitored based on changes in its electrical characteristics. Once the steel core of the traction steel belt is exposed, short circuited or disconnected, an abnormality can be detected and an alarm signal (relay output) can be issued.

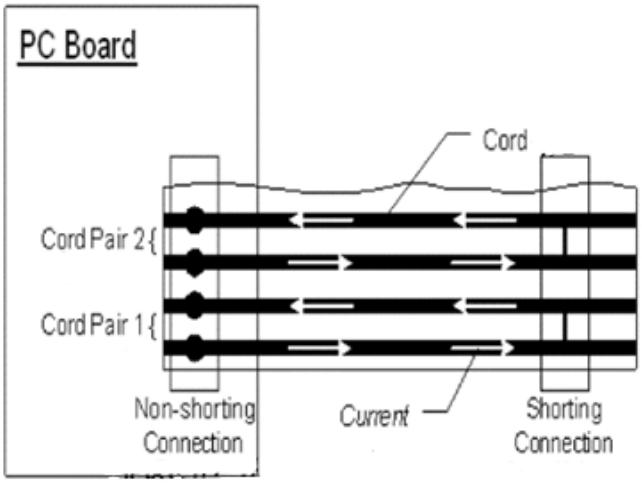


Fig 1.1 Functions principle

1.2 Functional characteristics

Multiple fault detections: steel strip steel core open circuit, steel strip steel core short circuit, steel strip steel core exposed.

Steel strip steel core open circuit: one or more steel cores can be detected by disconnecting.

Short circuit of steel strip and steel core: Two or more steel cores are exposed, and the exposed areas can be detected by overlapping and connecting them.

Exposed steel strip core: One or more steel cores are exposed and can be detected by overlapping with the external metal structure (PE).

Continuous resistance monitoring: Independent resistance monitoring for each steel strip (resolution<=1%).

Fault alarm output: relay normally open point fault output, independent fault light indication for each steel strip.

Multi steel strip monitoring: 1-3 (10 core or 12 core steel strips).

Mobile APP debugging: Built-in Bluetooth module, use mobile APP debugging.

Other: One click detection/self-learning.

1.3 External dimensions

Fig 1.2 Steel strip monitoring device product photo

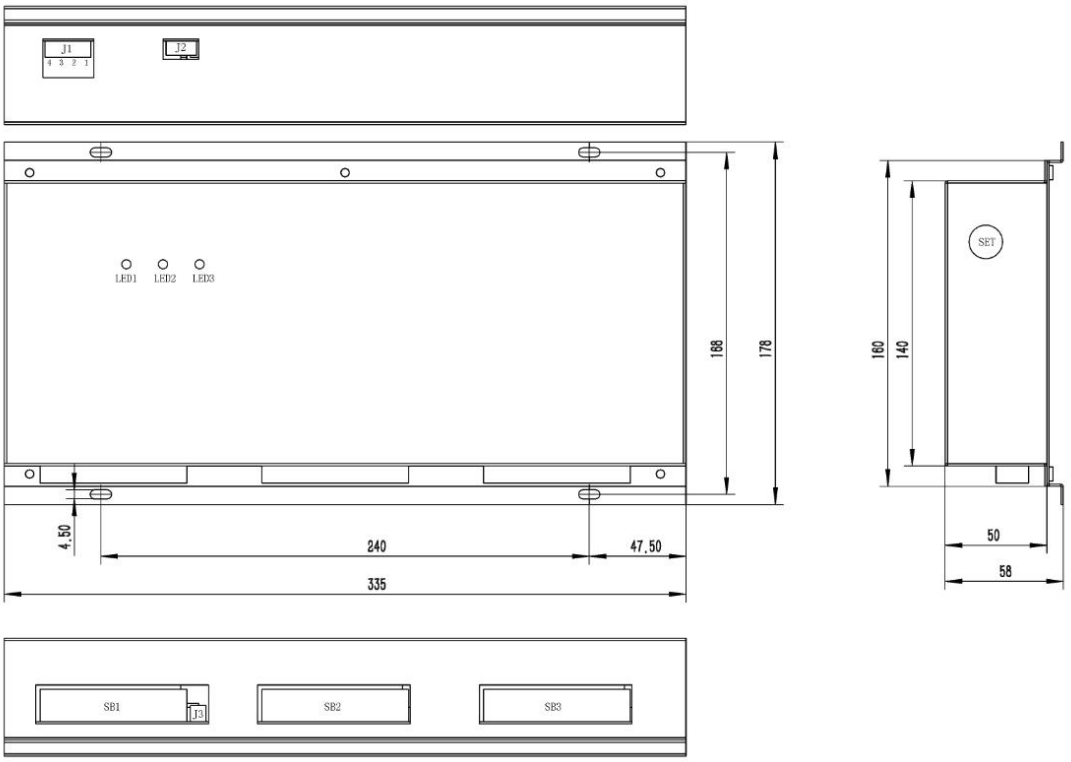


Fig 1.3 Dimensional drawing of steel strip monitoring device product (unit: mm)

1.4 Terminal Definition

<table>
<tr><th colspan="3">Port</th><th>Def</th><th>Function</th><th>Note</th></tr>
<tr><td rowspan="4">J1</td><td rowspan="4">5.08-4P</td><td>1</td><td>Y0+</td><td rowspan="2">Fault relay output</td><td rowspan="2">--</td></tr>
<tr><td>2</td><td>Y0-</td></tr>
<tr><td>3</td><td>GND</td><td rowspan="2">Power terminal</td><td rowspan="2">--</td></tr>
<tr><td>4</td><td>+24V</td></tr>
<tr><td>J2</td><td colspan="2">USB A</td><td>Debug port</td><td>For operator or Bluetooth module connection</td><td>Reversed port, product already has built-in Bluetooth.</td></tr>
<tr><td>B1</td><td colspan="2">5.08-12P</td><td>steel strip 1</td><td>Steel strip 1 head end interface</td><td>The plug needs to be tightened with screws. If using a 10 core steel strip, the last two pins need to be short circuited!</td></tr>
<tr><td>J3</td><td colspan="2">2.54-2P</td><td>External thermistor</td><td>External thermistor interface</td><td>Reserve external thermistor interface</td></tr>
<tr><td>B2</td><td colspan="2">5.08-12P</td><td>steel strip 2</td><td>Steel strip 2 head end interface</td><td rowspan="2">The plug needs to be tightened with screws. If using a 10 core steel strip, the last two pins need to be short circuited!</td></tr>
<tr><td>B3</td><td colspan="2">5.08-12P</td><td>steel strip 3</td><td>Steel strip 3 head end interface</td></tr>
<tr><td>LED1</td><td colspan="3">Steel strip 1 status light</td><td rowspan="3">Always on: abnormal steel strip;
Continuous rapid flashing: No self-learning is performed;
Quick flashing 3 times: steel strip detection in progress.</td><td>--</td></tr>
<tr><td>LED2</td><td colspan="3">Steel strip 2 status light</td><td>--</td></tr>
<tr><td>LED3</td><td colspan="3">Steel strip 3 status light</td><td>--</td></tr>
<tr><td>SET</td><td colspan="3">Steel strip detection/self-learning button</td><td>When not self-learning: Short press 3 times to trigger steel strip self-learning.
When self-learning has occurred: Short press once to trigger steel strip detection; Press and hold for 10 seconds to enter the self-learning mode, and the status light will flash quickly. Continue to short press for 3 more times to trigger the self-learning of the steel strip.</td><td>Self learning will reset the basic resistance value of the steel strip. Please operate with caution.</td></tr>
</table>

Chapter 2 Installation and Debugging

2.1 Installation

1. Use tools such as knives and diagonal pliers to peel off the outer composite material at both ends of the steel strip, exposing each steel core.

2. The end of the exposed steel core needs to be sufficiently cleaned to ensure good electrical connections. Grinding tools can be used for polishing.

3. Insert the exposed end of the steel core into the terminals of the head connector and end shorting device, and tighten the screws.

Attention! If using a 10 core steel strip, it is necessary to short circuit the last two pins of the 12P terminal (as shown in the figure below).

Steel strip head end connection equipment

The front end connection of the steel strip

The back end connection of the steel strip

Fig 2.1 Installation wiring diagram

2.2 Debugging

After installation, if the device has not yet undergone steel strip self-learning, it can be triggered by short pressing the SET button three times.

If self-learning has already been performed and you want to perform self-learning again, you can enter the waiting self-learning mode by long pressing for 10 seconds. At this time, the status light will flash quickly, and continue to short press 3 times to trigger the steel strip self-learning.

After self-learning, you can enter the menu interface through the Elevator Expert APP to view the basic resistance value of each steel strip S02. Under normal condition, the S02 value of each steel strip is not significantly different.

The default monitoring mechanism at the factory is to conduct a steel strip inspection every 20 seconds. If the deviation of the measured resistance value exceeds 25% each time, it is considered that the steel strip resistance is abnormal. If the steel strip resistance is detected continuously for 10 times, the steel strip abnormal alarm will be triggered and the fault relay will be activated.

If you want to change the testing cycle and other parameters, please enter the corresponding steel strip menu interface for setting.

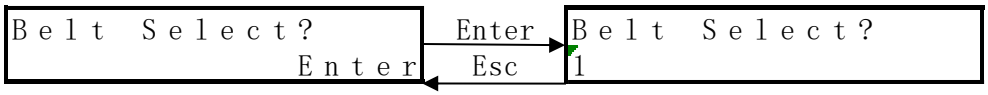
Chapter 3 Elevator Expert APP

This product has built-in Bluetooth function and can be debugged through the Elevator Expert APP. Currently, it only supports Android phones. The specific method is as follows:

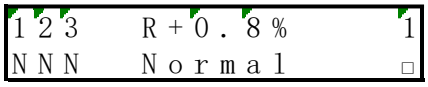
Open Bluetooth on your phone ->Open the elevator expert app to connect ->Debugging ->Settings ->Bluelight motherboard debugging ->Turn on debugging (ON).

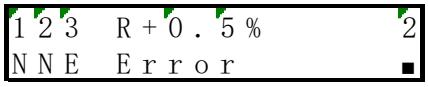
Menu	——	Return to main menu
Enter	——	Confirm when entering the lower menu or changing parameters
Esc	——	Cancel the operation or return to the higher-level menu
＞	——	right shift
∧	——	Up or ＋1， Yes， ON
∨	——	Down or －1， No， OFF

3.1 Main menu



Firstly, select the desired steel strip menu through the steel strip menu selection interface, confirm and enter the main menu interface below.





The "1" and "2" on the far right of the first row indicate which steel strip the menu parameter interface belongs to, and this label is displayed in all menus.

The first line's "123" and the second line's "SSS" and "SES" indicate the status of steel strip 1, steel strip 2, and steel strip 3.

O: Offline monitoring equipment for # * steel strip;

N: The * steel strip has been learned and is under normal monitoring;

S: The * steel strip has not yet undergone self-learning;

E: * Steel strip abnormal alarm.

The "R+0.8%" and "R+0.5%" in the first line indicate the proportion of resistance change in the current steel strip.

The "Normal" and "Error" in the second line indicate the operating status of the device.

Normal： All steel strips have no abnormalities；

Error： Steel strip abnormal alarm, please refer to the steel strip status indicator in the front for specific steel strip abnormalities.

The rightmost "□" and "■" on the second line indicate the action status of the faulty relay.

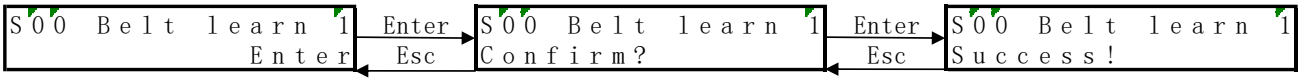
□: Fault relay not activated;

■: Fault relay action.

3.2 Parameter setting

Press "Enter" in the main menu to enter the parameter settings menu。

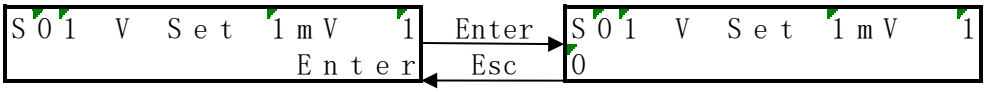
3.2.1 Steel strip self-learning



This interface can trigger steel strip self-learning once.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

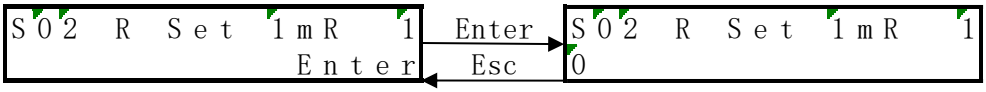
3.2.2 Excitation voltage setting



This interface can set the output voltage during monitoring and can be automatically set through self-learning of the steel strip.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

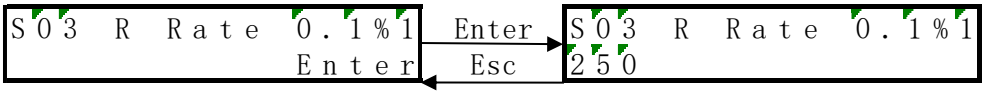
3.2.3 Steel strip resistance setting



This interface can set the basic resistance value of the steel strip, which can be automatically set through self-learning of the steel strip.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

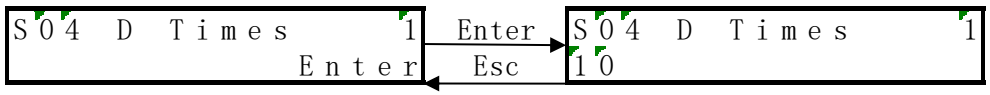
3.2.4 Abnormal resistance ratio of steel strip



This interface can set the proportion of abnormal resistance of the steel strip, which is set to 25% by default. That is, if the resistance of the steel strip changes by more than ± 25%, it is considered abnormal.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

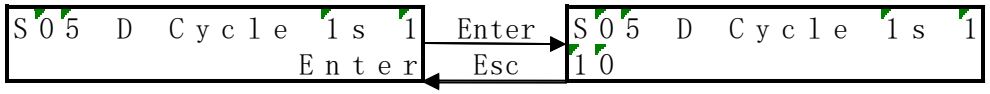
3.2.5 Upper limit of abnormal alarm for steel strip



This interface can set the number of times the steel strip resistance is abnormal, with a default of 10 times, which means that an alarm will be triggered if the steel strip resistance is abnormal for more than 10 consecutive detections.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

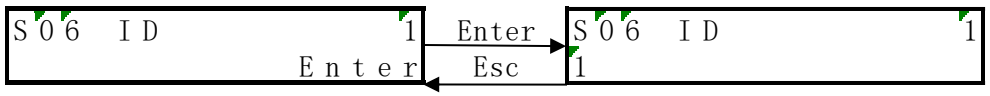
3.2.6 Steel strip inspection cycle



This interface can set the steel strip detection cycle, which defaults to 10 seconds, meaning that the steel strip resistance is detected every 10 seconds.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

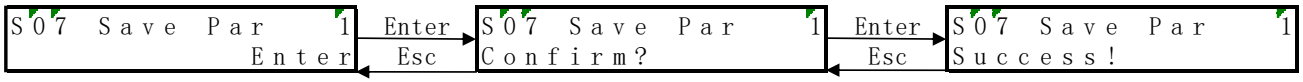
3.2.7 Device ID



This interface can set the device ID, which corresponds to the physical interface of the steel strip. Please do not modify it.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

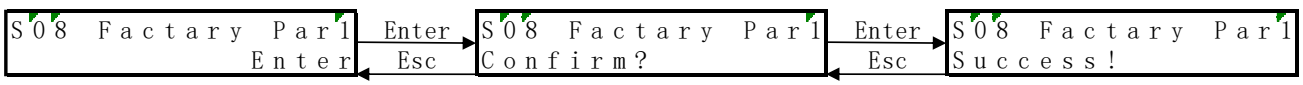
3.2.8 Save Parameter



After setting each parameter, save it to ensure that these parameter settings remain valid even after power failure. After successful saving, press the "Esc" button to return to the save parameter interface.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

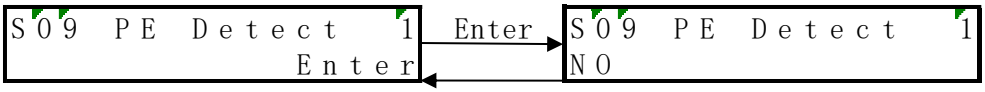
3.2.9 Reset to default setting



If parameter errors are caused by interference, the factory reset operation can be performed. After restoring the factory reset, the parameters need to be saved.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

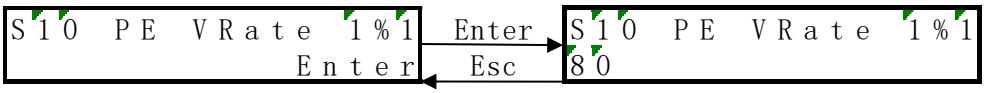
3.2.10 PE leakage (exposed steel strip overlapping PE) detection enable



This interface allows configuration of whether to enable the PE leakage (exposed steel strip overlapping PE) detection function, which is disabled by default. When the conditions are met—exposed steel strip overlapping causing PE leakage, good connection between PE and the equipment casing, and no interference signals on PE—the leakage detection function can be enabled. It will then perform periodic (1s) detection of steel strip leakage and count the occurrences. Once the count reaches 100 times (configurable), the fault relay will immediately engage to trigger an alarm..

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

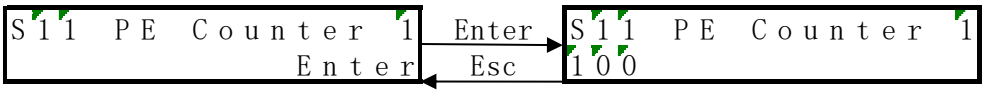
3.2.11 PE leakage detection voltage threshold



This interface allows configuration of the PE leakage detection voltage threshold. When the detected PE leakage voltage exceeds this threshold, the PE leakage count will increment by 1.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

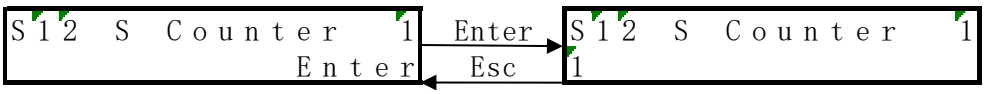
3.2.12 PE leakage detection alarm threshold



This interface allows configuration of the PE leakage detection alarm threshold. When the detected PE leakage count exceeds this threshold, a PE leakage fault will be reported.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

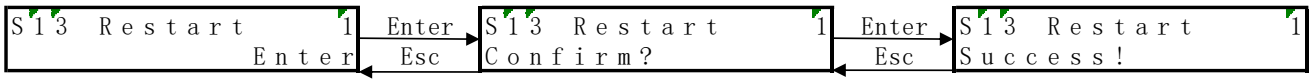
3.2.13 Short circuit detection alarm threshold



This interface allows configuration of the short circuit detection alarm threshold, with a default value of 1. A fault will be reported immediately upon detecting 1 occurrence of steel strip short circuit.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

3.2.14 Reset device

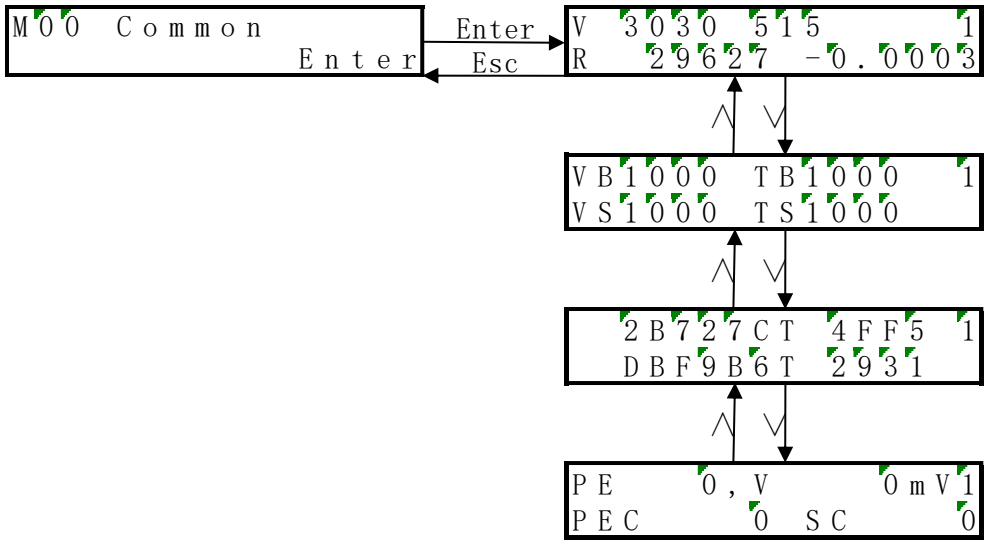


Users can perform device restarts through this menu.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

3.3 Monitoring interface viewing status

3.3.1 Device status monitoring



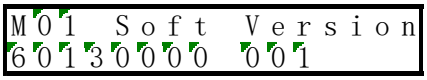
The first line V 3030 515: Steel strip voltage 3030mV, sampling voltage 515mV;

The second line R 29627-0.0003: The deviation ratio between the steel strip resistance 29627m Ω and the basic resistance is -0.0003;

The following two interfaces are internal monitoring data from the manufacturer. PEC refers to the PE leakage count after enabling PE leakage detection, and SC refers to the short - circuit detection count. Both counts are cleared upon power loss.

Note: The "1" in the upper right corner indicates that this menu is for the 1st steel strip.

3.3.2 Software version



In this interface, you can view the current software version number. (e.g. 61030000_001)