HC51x Series Indicator

Technical Instruction Manual

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Please read this manual carefully before operating the indicator.

1 Introduction

1.1 Warnings

Failure to heed these warnings may result in serious injury or even death.

- DO NOT allow children or inexperienced persons to operate the indicator.
- DO NOT operate without all shields and guards in place.
- DO NOT step on the unit.
- DO NOT place fingers into slots or possible pinch points.
- DO NOT use the indicator if any of the components are cracked.
- DO NOT exceed the rated load limit of the indicator.
- DO NOT make alterations or modifications to the indicator.
- DO NOT use near water.

Before opening the indicator, ensure the power cord is disconnected from the outlet.

1.2 Features

- High resolution analog-to-digital conversion
- Carbon steel enclosure for rigid EMC environment
- 4-digit 7-segment alphanumeric LED display
- 3 high reliable relays of 10A contact rating
- 3 LED annunciators for relay status
- Drives up to 12pcs 350Ω loadcells
- Industrial protection with resettable fuse
- Automatic zero-tracking

1.3 Options

- 4~20mA current-loop analog output (A)
- CAN bus communication(C)
- Cabin door signal input (H)
- 4th relay for motor control or 50%F.S. set-point (R)
- 0-10V analog output (V)

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1.4 Functions

Load	Normal Close Relay n						Annunciator		
	OUT = normal (default)			OUT = inverse					
	1	2	3	1	2	3	1	2	3
power-off	Close	Close	Close	Close	Close	Close	Off	Off	Off
< H15 Weight	Close	Close	Close	Open	Open	Open	Off	Off	Off
>= H15 Weight	Open	Close	Close	Close	Open	Open	On	Off	Off
>= H90 Weight	Open	Open	Close	Close	Close	Open	On	On	Off
>= H110 Weight	Open	Open	Open	Close	Close	Close	On	On	On

1.5 Specifications

Analog Performance

Full Scale Input Signal	-11.7 ~ +11.7 mV (-3.9 ~ +3.9 mV/V)
Loadcell Excitation Voltage	3.0 ±3% V_{DC} (typ.)
Number of Loadcells	12 x 350Ω / 16 x 700Ω
0-10V Output Load (optional)	500 Ω (max.)
0-10V Output Linearity (optional)	± 0.5 %F.S.

Metrology Performance

Cut-off Range	110 %F.S. (dft.)
Warning Range	90 %F.S. (dft.)
Half Range	50 %F.S. (dft.)
Pre-caution Range	15 kg (dft.)
Manual-Zero Range	100 %F.S.
Zero-tracking	-100~5 kg/s

User Interface

Display	4-digit LED, 0.56inch/14.2mm 7-segment
Annunciators	Overload, Caution, Pre-caution
Keypad	3-key flat tactile switch

Relays

Number of Relays	3 or 4 (optional)
Contact Materials	$AgSnO_2$, AgCdO
Contact Resistance	100 mΩ (1 A / 6 V_{DC})
AC Contact Ratings	10 A / 277 V_{AC}
DC Contact Ratings	10 A / 28 V_{AC}

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Coil Power at Pickup Voltage	2770 VA / 210 W (typ.)
Insulation Resistance	1000 MΩ (500 V_{DC})
Contact to Coil Dielectric Strength	1500 V_{AC} (1min.)
Open Contacts Dielectric Strength	750 V_{AC} (1min.)
Electrical Life	10^5 operations (typ.)
Mechanical Life	10^7 operations (typ.)

Power Supply

Power Supply	HC510: 230V_{AC} +/-10% / 50~60Hz	HC512: 24V_{DC} +/-10%
Fusing	1.10 A resettable	
Power Consumption	6 W (max.)	

Environmental

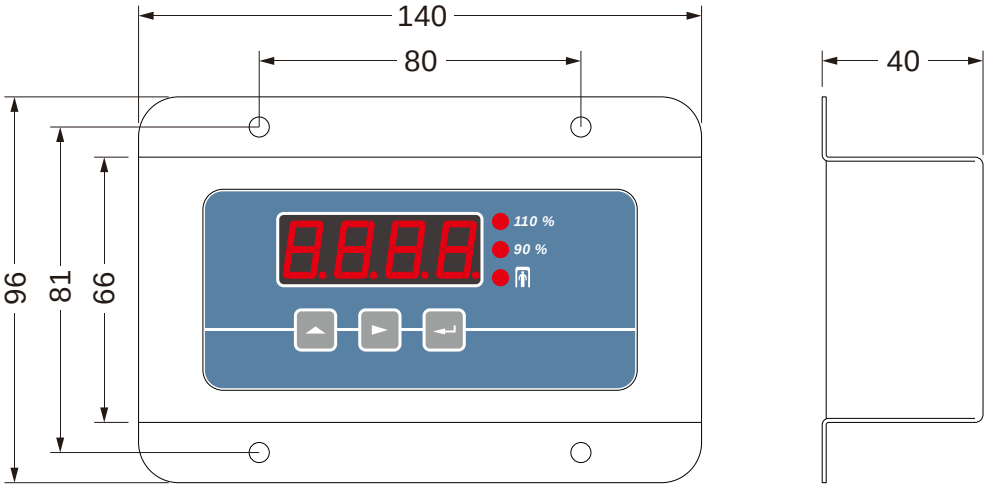
Operating Temperature	-10 ~ +40 °C (+14 ~ +104 °F)
Storage Temperature	-20 ~ +50 °C (-4 ~ +122 °F)
Operating Humidity	0 ~ 90 % at 20 °C (rel.)

Enclosure

Enclosure Material	Carbon Steel
Indicator Net Weight	0.60 kg (1.32 lbs.)
Enclosure Dimensions	14.0 x 9.6 x 4.0 cm (5.5 x 3.8 x 1.6 inch)

2 Installation

2.1 Dimensions



Dimensions in Millimeters

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2.2 Keypad

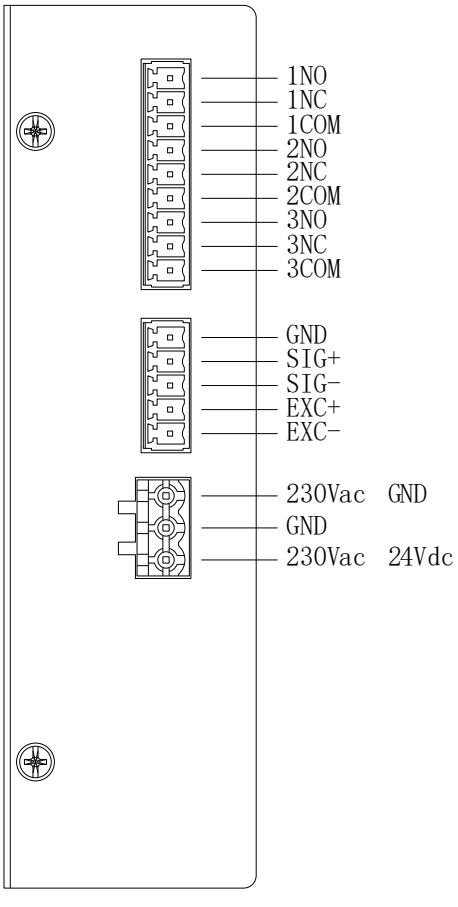
	Up	Increase blinking digit
	Right	Move blinking digit right
	Enter	Confirm and go to next

2.3 Annunciator

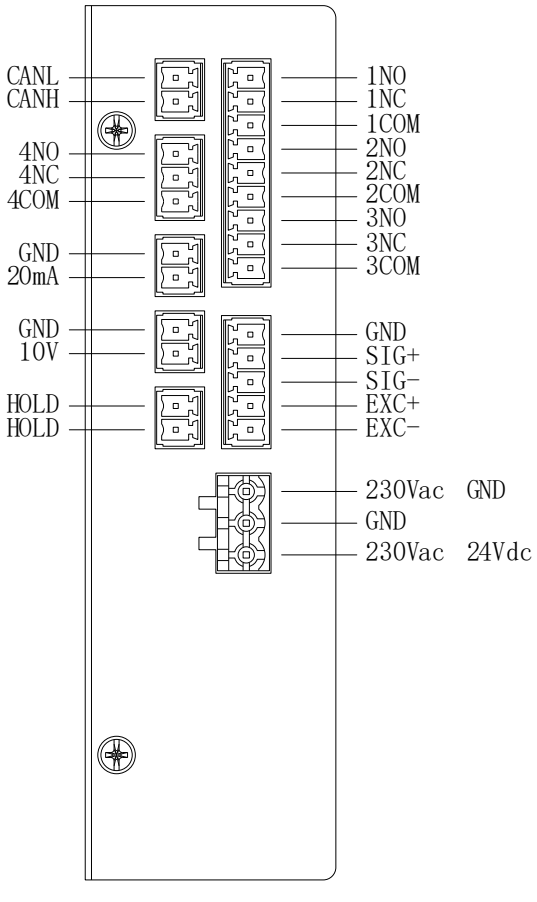
● ***110 %***	Light on when load is over 110%F.S (by default)
● ***90 %***	Light on when load is over 90%F.S (by default)
● 	Light on when load is over 15kg (by default)

2.4 Interface

Standard version:



Optional additional connections:



NO: Normal Open; NC: Normal Close

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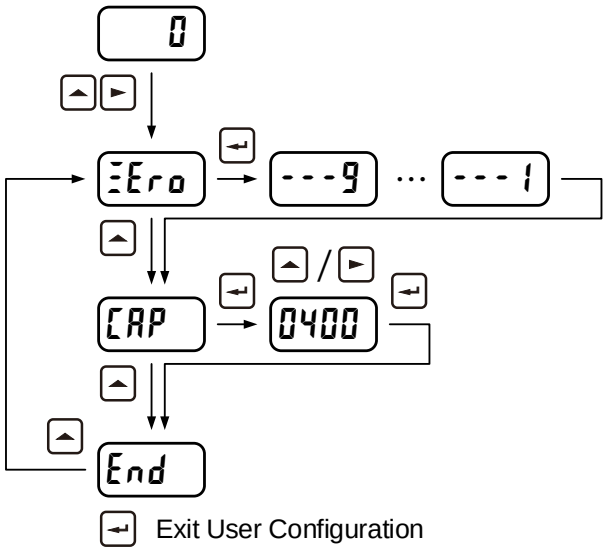
3 Configuration

3.1 User Configuration

In Normal/Work Mode

Press ▲ and ► at the same time for 1 sec. to enter User Configuration.



3.1.1 Zero

Zero function takes out the system deviations in zero when needed.

When ZEro shows.

Press ↵ to perform zero.

Indicator will count down in 10 seconds to wait for operater to leave the cabin.

3.1.2 Capacity

When CAP shows.

Press ▲ to increase blinking digit, press ► to move blinking digit right.

Input the rated capacity of the lift system, in kg unit. *

Press ↵ to confirm.

When End shows, press ↵ to return to normal mode.

3.2 System Configuration

In User Configuration

When End shows, press ▲ and ↵ at the same time for 1 sec. to enter password mode. Please refer to the diagram on the next page.

In Password Mode

Press ▲ to increase blinking digit, press ► to move blinking digit right. Input Password.

Press ↵ to confirm password (0258) and enter sub menu.

3.2.1 Display Unit

Display Unit defines the system's weight unit on the LED display.

If KG is selected, the weight reading is in kg unit. For example, 1055 means 1055 kg.

If t is selected, the weight reading is in t(ons) unit.

The decimal point is always fixed and the unit t is always shown.

For example, 1.05t means 1.05t. After display Unit is configured, all the user-input will be changed to accommodate to the new display format.

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3.2.2 Gain Ratio

The Gain Ratio GA in is the ratio to multiply the real weight.

If Gain is set to 1, the displayed weight is the real weight. If Gain is set to 2, the display weight is twice the real weight.

3.2.3 Zero Delay Time

The Zero Delay Time Zd defines the period of the count-down timing for user to walk out of the cabin during Zero and calibration.

The Zero Delay Time can be set from 0s to 60s, in 5s steps.

3.2.4 Pre-caution Weight

Pre-caution Weight H 15 is the detection threshold against a light weight, such as animal, infant, etc.

Pre-caution Weight can be set from 0 to 50kg;

By default it is set to 15kg.

When the load is greater than Pre-caution Weight,

● lamp lights on

Relay 1 set.

3.2.5 Warning Weight

Warning Weight H90 is the detection threshold for 90%F.S.

When the load is greater than Warning Weight,

● ***90 %*** lamp lights on

Relay 2 set.

3.2.6 Cut-off Weight

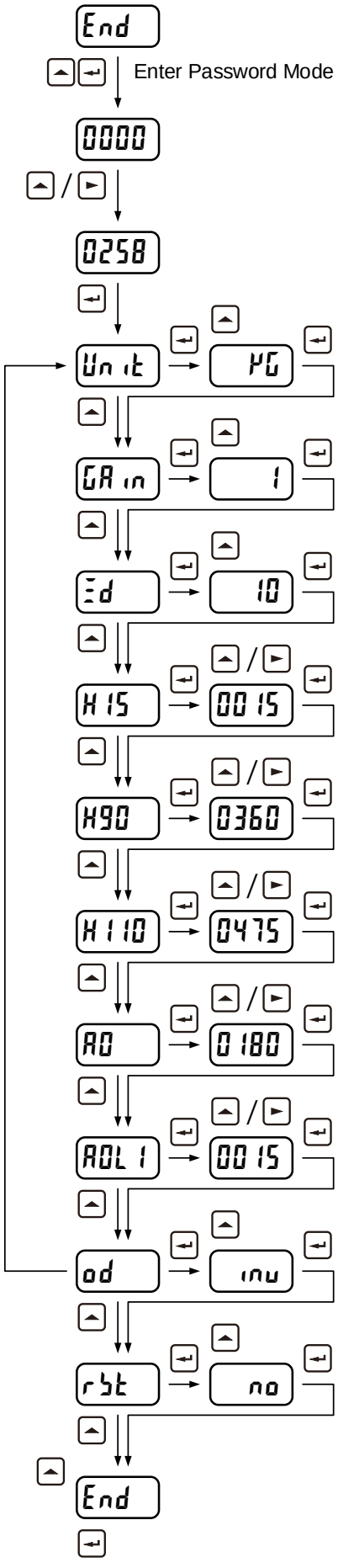
Cut-off Weight H 110 is the detection threshold for 110%F.S.

When the load is greater than Cut-off Weight,

● ***110 %*** lamp lights on

Relay 3 set.

Note: The beeper keeps alarming every 300ms.



** = The maximum system's capacity is determined by the sum of the loadcells' capacity.*

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3.2.7 Zero-tracking Time

The indicator's Zero-tracking function will enhance system temperature and drifting performance, if properly set.

Zero-tracking Time  can be set from 0s to 180s.

3.2.8 Zero-tracking Range

Zero-tracking Range  can be set from 5kg to 50kg.

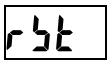
3.2.9 Output Mode

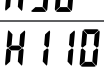
The three relays can be configured to work in 2 modes; normal logic mode and inverted logic mode.

In normal logic mode, relay works in NC way. When the load is greater than set-point, the corresponding relay will open, otherwise it is closed.

In inverted logic mode, relay works in NO way. When load is greater than set-point, the corresponding relay will close, otherwise it is open.

3.2.10 System Reset

System Reset  is used to reset all configuable parameters to its default / their default value.

Item	Display	Note
Display Unit		Select unit. kg or t
Gain Ratio		Select gain ratio. 1 or 2
Zero Delay Time		Select zero delay time. 0, 5, .., 55, 60
15%FS Weight		Input the 15% weight. Val ≤ 50kg
90%FS Weight		Input the 90% weight. P15 ≤ Val ≤ max capacity*
110%FS Weight		Input the 110% weight. P90 ≤ Val ≤ max capacity*
Zero-tracking Time		Input the tracking time. 0s ≤ Val ≤ 180s
Zero-tracking Range		Input the tracking range. 5kg ≤ Val ≤ 50kg
Relay Output Mode		Select output logic; NORmal (=dft.) / INVerted
System Reset		YES/NO

** = The maximum system's capacity is determined by the sum of the loadcells' capacity.*

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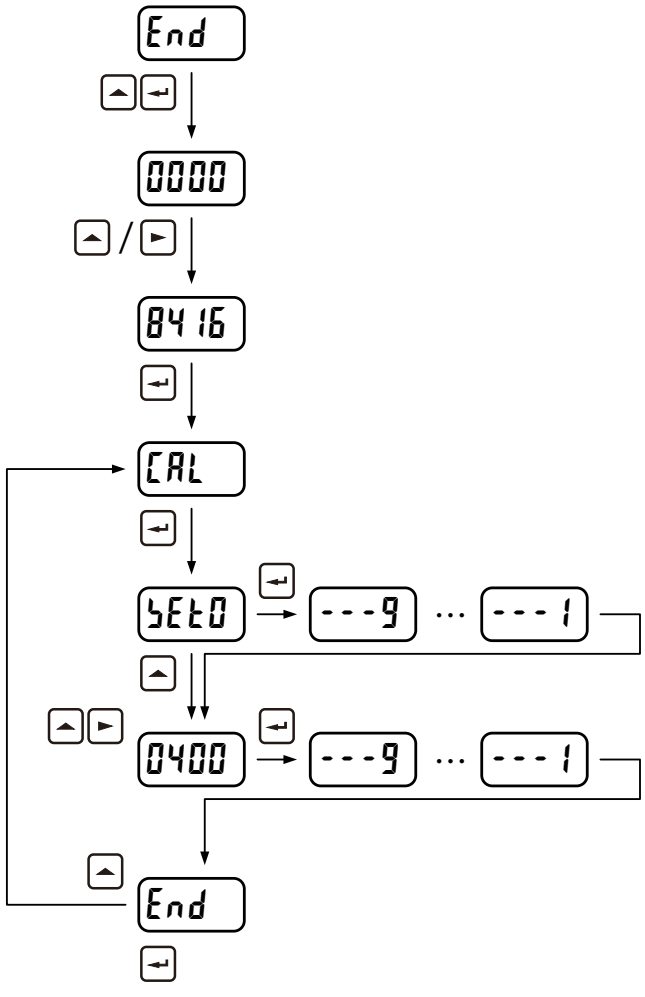
3.3 Calibration

To re-calibrate the lift system, prepare the calibration weight at 20%-50% of the lift's capacity.



In Normal/Work Mode

Press ▲ and ► at the same time for 1 second to enter menu.

Press ▲ to go to End.

Press ▲ and ↵ at the same time for 1 second to enter password mode.

In Password Mode

Press ▲ to increase blinking digit, press ► to move blinking digit right. Input Password (8416).

Press ↵ to confirm password and enter calibration.

When SEt0 shows, make sure the lift cabin is empty (without any load).

Press ↵ to start zero calibration.

Indicator will count down from 9 to 0.

During this 10 second count-down, the operator needs to walk out of the cabin.

When 400 shows, apply the calibration weight.

Press ▲ to increase blinking digit, press ► to move blinking digit right.

Input weight value.

Press ↵ to start weight calibration.

Indicator will count down from 9 to 0.

During the 10 second count-down, the operator needs to walk out of the cabin also.

After End shows, the calibration is successfully done.

Press ↵ to return to normal mode.

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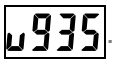
3.4 0-10V Adjustment (optional)

To adjust the indicator's output voltage, a voltmeter or multi-meter is needed.

Connect the output V+ terminal to voltmeter's positive pin (red cable), and connect the output GND terminal to voltmeter's negative pin (black cable).

During the power-up (display shows 8888).

Press ▲ and ► and ↵ at the same time, and quickly release them, to enter the 10V adjustment mode.

The display shows  .

The last 3-digit is the adjustment ratio, ranging from 000-999.

Press ▲ to increase blinking digit, press ► to move blinking digit right. Modify the ratio, to make the output voltage to be 10.0V.

Press ↵ to confirm and exit.

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