ENTES

DC AMMETER
DCA-10 / 10A / 10C / 10S / 10CS / 11 / 11A / 11C / 11S / 11CS
User Manual and Menu Map

CE

A6645 / Rev.4

www.entes.com.tr

ATTENTION
- **Disconnect all power before connecting the device.**
- **Don't remove the front panel while the device is connected to the network.**
- **Don't clean the device with solvent or similar substances. Only clean with a dry cloth.**
- **Verify correct terminal connections when wiring.**
- **Electrical devices should be serviced only by your component seller.**
- **Device is for rack panel mounting only.**
- **Fuse which will be used must be F type and its current limit value must be 1A.**
- **No responsibility is assured by the manufacturer or any of its subsidiaries for any problems arising out of the disregard of these conditions.**

Note: The contact resistance at ohmic load (e.g.: Incandescent bulb, Resistance devices) is 5A.
It is recommended to use a contactor if the inductive load e.g.: AC motor, fluorescent, etc.) or
capacitive load (e.g. : Led Drivers, UPS, Fluorescent (Electronic Ballast), etc.) switch. Otherwise adhesion
may occur in relay contacts.

SECURITY

Read the user manual completely before using the device.

The box is under dangerous high voltage. The device must be installed and serviced only by a qualified service personnel·

Displayed only when limit is crossed in opposite direction. `H CURRENT` If a current higher than the defined current value flows through the shunt resistor, a warning is displayed like the one on the left.

Is not displayed when limit is crossed in opposite direction.

Note: This instruction manual is applicable to devices with Rev.2.00.00 and later versions. (devices with INFO menu)

Warnings

- Connect a button or a circuit breaker between the grid and the supply inputs of the device.
- This button or circuit breaker must be in close proximity of the device.
- This button or circuit breaker must be marked to indicate that it is used to separate the device from the grid.

Standards That Are Applied To The Device

EN 61010-1, EN 61000-4-2, EN 61000-4-4, EN 61000-4-5, EN 61000-4-8, EN 61000-4-11

Guarantee
The device has a 2 year guarantee. In case of a malfunction, repairs of the device must be done only by the authorised technical service or the guarantee will be void.

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1.INTRODUCTION
1.1.APPLICATIONS:
You can achieve the following measurements and applications with the device.

- Current values of various DC systems can be measured with adjustable shunt current and voltage values.
- All measured parameters can be transferred via RS485 line with MODBUS protocol and menu settings can be set remotely. (DCA-10S/10CS/11S/11CS)
- With 2 programmable Alarm Relays, a range in which the monitored system current should reside can be determined and a warning signal can be created for the user with Alarm1 (C1) and Alarm2 (C2) contact outputs if this monitored current goes out of the determined range. (DCA-10C/10CS/11C/11CS)
- With a programmable Analog Output, the device can be programmed to give a voltage or current output according to the measured current value. (DCA-10A/11A)
- Measured maximum-minimum values can be monitored by using UP/DOWN buttons.
- Settings can be accessed easily and read comfortably with the back-lit LCD feature.
- Measurement results can be calculated in a desired time with an adjustable measurement period of 1-600 s.
- The device provides flexible usage with wide supply voltage range. 85-265 V AC/DC (DCA-10/10A/10C/10S/10CS), 10-56V DC (DCA-11/11A/11C/11S/11CS)
- The device settings can be protected from changes by unauthorized personnel by specifying a 4 digit user password.

1.2 GENERAL FEATURES
The device is designed to measure the current on a DC system through an externally connected shunt resistor.

1.3 FRONT PANEL

The device has a back-lit 2.5" LCD which contains two lines as numeric and alpha-numeric, warning symbols and notification signs. There are three buttons for programming the device. Explanations about the display and buttons are listed on the right side.
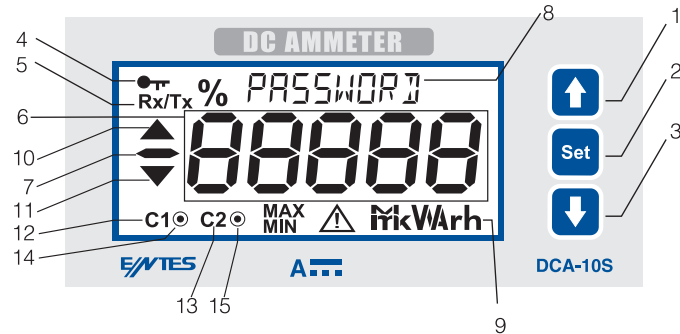
Usage of Front Panel and Buttons

1. Up button
2. Set button, for entry to menu and value entry
3. Down button
4. Indicates that the password protection is active.
5. Indicates the existence of communication. It blinks during communication. (DCA-10S/10CS/11S/11CS)
6. The line where measured parameters are displayed.
7. Indicates the direction of the measured current.
8. Indicates the notification messages or the menu where the user is.
9. Units belonging to measurements and analog output parameters.
10. Indicates that the contact or contacts are in a high fault state. When entering a value in High Alarm type, it lights up continuously. When entering a low value for Range Alarm type, it lights up continuously and when entering a high value for Range Alarm type, it blinks.(DCA-10C/10CS/11C/11CS)
11. Indicates that the contact or contacts are in a low fault state. When entering a value in Low Alarm type, it lights up continuously. When entering a high value for Range Alarm type, it lights up continuously and when entering a low value for Range Alarm type, it blinks.(DCA-10C/10CS/11C/11CS)
12. 1st Contact Output (DCA-10C/10CS/11C/11CS)
13. 2nd Contact Output (DCA-10C/10CS/11C/11CS)
14.15. Indicates that the contacts are closed.(DCA-10C/10CS/11C/11CS)

Special Functions for Buttons

UP button: It helps you display maximum voltage value during measurement.
In programming mode, it is used to switch device parameters. If lock function is active,
it enables alarm output contacts when tension value exceeds the configured threshold.
When the tension is between the set limits, alarm output contacts are not turned off
(locked-hold).
When pressed together with DOWN button (UP + DOWN), output switches are
turned off.

SET button: When you hold down this button for 3 seconds, MAIN MENU mode is activated.
It is used to switch from MAIN MENU to SUB MENUS and to save parameter changes.

DOWN button: It helps you display minimum voltage value during measurement.
In programming mode, it is used to switch device parameters.
If lock function is active, it enables alarm output contacts when tension
value exceeds the configured threshold. When the tension is between
the set limits, alarm output contacts are not turned off (locked-hold).
When pressed together with UP button (UP + DOWN), output contacts are turned off.

1.4 HARDWARE FEATURES
- Current measurement connector (2-pin, I+, I-)
- 0/2-10V, 0-4/20 mA Analog Output connector (3-pin, V, GND, I)(DCA-10A/11A)
- RS-485 connector (4-Pin)(DCA-10S/10CS/11S/11CS)
- 2 Relay connectors (4-pin)(DCA-10C/10CS/11C/11CS)
- Supply input (2-pin) (85-265 VAC/DC (DCA-10/10A/10C/10S/10CS),
  10-56 VDC (DCA-11/11A/11C/11S/11CS))

2. USAGE OF DEVICE:
2.1 MENU USAGE AND SETTINGS:
After the device is installed according to the connection diagram in the user manual, energise the
device.(Refer to: Connection diagram)

In order for the measurements and applications to be accurate, necessary adjustments must be made
by using menus.

2.2 MAIN MENUS:
There are 12 main menus on the device for measurement and usage settings. The user can access
MAIN MENUs by pressing the SET button for 3 seconds on measurement screen. By pressing the SET
button on any MAIN MENU, SUB MENUs of the related MAIN MENU is entered.

To make a change valid in a menu,you need to confirm when exiting the menu. Otherwise the change
will not be valid.

MAIN MENU FLOW

Only valid for DCA-10C/10CS/11C/11CS.

Only valid for DCA-10A/11A.

Only valid for DCA-10S/10CS/11S/11CS.

Set | Press for 3 seconds.
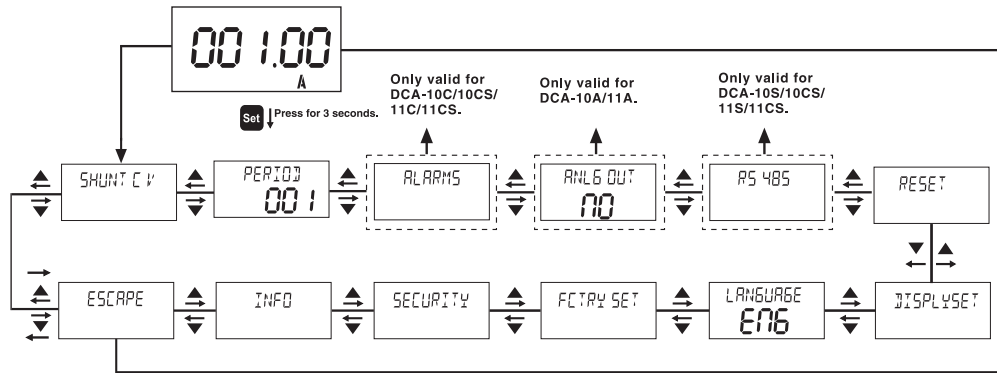
2.2.1 SHUNT MENU

Current and voltage values of the external shunt resistor which will be connected to the device to measure the current is set in this menu. There are 2 submenus under SHUNT menu. **"SHUNT C", "SHUNT V".**
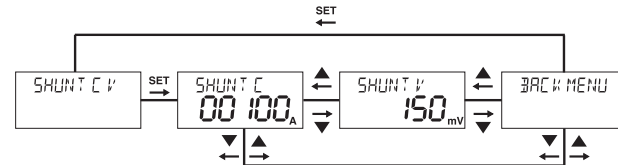

"SHUNT C" Shunt Current Setting Menu

The current value of the shunt resistor which will be connected to the device is entered in this menu. Shunt current can be entered between 1A and 10000A (10 kA). When this parameter is changed, maximum and minimum current values stored up until that time are deleted.

Note: The shunt that you will connect to the system must have a current characteristic 1.5 times than the current need of your system. Example: If your current need is 100A, the minimum current value of the shunt that you will connect must be 150A.

If you connect a 100A shunt to a 100A system, it may cause the shunt to burn up over time. Additionally; in order for the shunt to be compatible with the measuring class of the device, it must be minimum 0.5% class. Otherwise, you can't obtain a 0.5% accuracy with the measurements made with the device.

"SHUNT V" Shunt Voltage Setting Menu

The voltage value of the shunt resistor which will be connected to the device is entered in this menu. Shunt voltage can be entered between 50mV and 150mV. When this parameter is changed, maximum and minimum current values stored up until that time are deleted.


2.2.2 "PERIOD" Period Setting Menu

After the device samples for a specified time, it displays the measurement result by calculating the mean value of those samples. You can set the sampling time in this menu. Period value can be entered between 1-600 seconds.

2.2.3 "ALARMS" Alarms Menu

DCA -10C/10CS/11C/11CS devices have two normally open (NO) contact outputs. Operating modes of the alarms are set in this menu. Each alarm can be set to one of six operating modes. These modes are high alarm, low alarm, high-low (range) alarm and their 3 inverted counterpart modes. This menu has 2 sub-menus.
"ALARM1", "ALARM2"
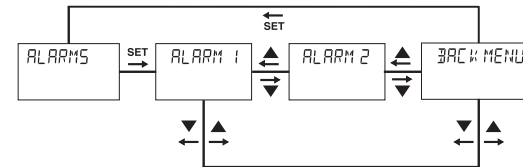
"ALARM1"Alarm 1 Setting Menu

Operating mode of the relay on the device and the parameter according to that operating mode is set in this menu. All settings belonging to 1. Alarm relay is done in this menu. Settings belonging to 2nd Alarm relay can be done in **"ALARM2"** menu. This menu has 1 sub-menu.
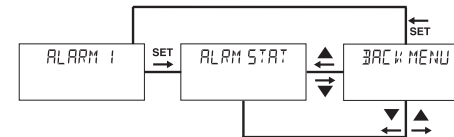
"ALRM STAT" Alarm Status Setting Menu

Alarm function of the relay is activated in this menu. If **"OFF"** option is selected in this menu, alarm parameters of the corresponding relay can't be accessed.

If you wish to use the alarm function, **"ALRM STAT"** should be set to **"ON"** via this menu.
When alarm status is set to **"ON"**, 4 sub-menus are activated under this menu.
These are, respectively, **"CONTCT POS"**, **"TRIP"**, **"LOCK"** and **"ALRM TYPE"** menus.
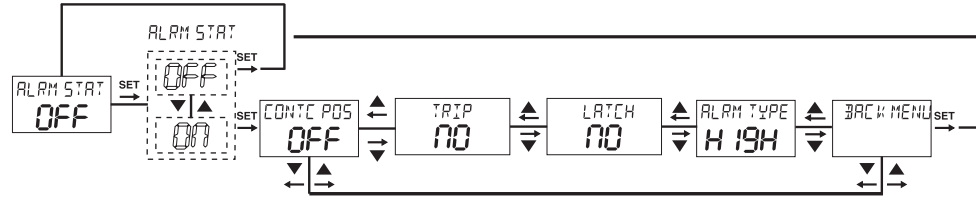
"CONTC POS" Contact Position Setting Menu

The starting position of the alarm relay output is set in this menu. If this option is selected as **"OFF"**, contact output starts as open when there isn't a fault condition. If this option is selected as **"ON",** contact output will be closed when there isn't a fault condition. It is set **"OFF"** as factory default.
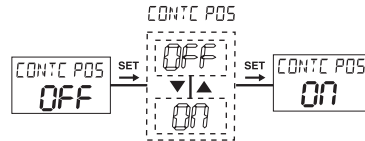

"TRIP"

If the measured current value becomes more than 1.5 times of set maximum current value when the **"TRIP"** function is selected as **"YES"**, related alarm contact will open without a delay. In this case, up segment on the LCD and the dot in the C1 segment turn on. If the measured current value becomes less than 0.5 times of set minimum current value, related alarm contact will open without a delay. In this case, down segment on the LCD and the dot in the C1 segment turn on.
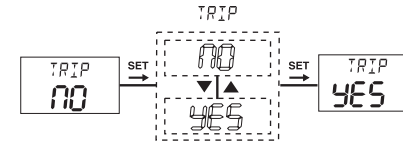
"LATCH"

When the latch function is selected as **"YES"**, a predefined alarm contact will open in case an alarm state arises. When the alarm state is resolved, the contact remains open (It latches). To close the alarm outputs after the alarm state is resolved, SET button is pressed. When the latch function is selected as **"NO"**, the opened alarm output will close after the predefined delay time.
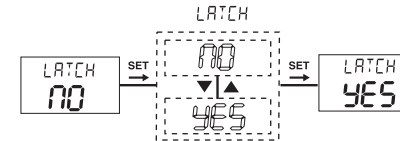
"ALRM TYPE" Alarm Type Setting Menu

Operating mode of the alarm is set in this menu. Alarm has 3 operating modes which are High, Low and Range (High-Low).

When the alarm type is selected as **High Alarm,** first contact output opens after an on-delay time **("H ON DEL")** if the measured current becomes more than the entered maximum current value **("HGH VALUE")** and immediate opening option is inactive. In this case, up segment on the LCD and the dot in the C1 segment turn on. When the measured current drops below the set maximum val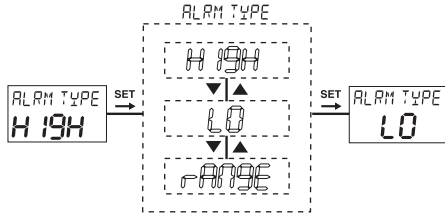ue **("HGH VALUE")** as much as the high hysteresis value **("HIGH HYS")** and immediate opening option is inactive, first output contact closes after an off-delay time **("H OFF DEL")**. In this case, up segment on the LCD and the dot in the C1 segment turn off.

When the alarm type is selected as **Low Alarm,** first contact output opens after an on-delay time **("L ON DEL")** if the measured current becomes less than the entered minimum current value **("LOW VALUE")** and immediate opening option is inactive. In this case, down segment on the LCD and the dot in the C1 segment turn on. When the measured current rises above the set minimum value **("LOW VALUE")** as much as the low hysteresis value **("LOW HYS")** and immediate opening option is inactive, first output contact closes after an off-delay time **("L OFF DEL")**. In this case, down segment on the LCD and the dot in the C1 segment turn off.

When the alarm type is selected as **High-Low Alarm (Range)**, **"LOW VALUE"** operates as low alarm and **"HGH VALUE"** operates as high alarm. While this alarm type is selected, minimum current value (**"LOW VALUE"**) can't be entered higher than maximum current value (**"HGH VALUE"**).

HIGH ALARM
"HGH VALUE"

The highest value that you want the measured current to reach is entered in this menu. A value of +/- Shunt Current Value can be entered

"HIGH HYS"

In this menu display, you should set the percentage value of hysteresis current required to return the device to normal current (in case of high current warning). This value shall be between 0 and 20.

"H ON DEL"
It is the delay time for the high current alarm to activate. The value is entered as seconds. It can be entered between 000.0 and 999.9 seconds.

"H OFF DEL"
It is the delay time for the high current alarm to deactivate. The value is entered as seconds. It can be entered between 000.0 and 999.9 seconds.

LOW ALARM
"LOW VALUE"
The lowest value that you want the measured current to reach is entered in this menu. This value can be entered between +/- Shunt Current value.

"LOW HYS"
In this menu display, you should set the percentage value of hysteresis current required to return the device to normal current (in case of low current warning). This value shall be between 0 and 20.

"L ON DEL"
It is the delay time for the low current alarm to activate. The value is entered as seconds. It can be entered between 000.0 and 999.9 seconds.
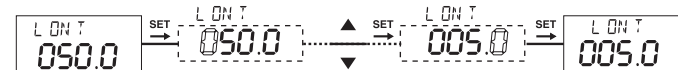
"L OFF DEL"
It is the delay time for the low current alarm to deactivate. The value is entered as seconds. It can be entered between 000.0 and 999.9 seconds.

2.2.4 "ANLG OUT" Analog Output Setting Menu
"ANLG OUT"

The device can give a voltage or current output with respect to the measured current according to your selection. Analog output value can be selected as 0-10V, 2-10V, 0-20mA or 4-20mA. The user can set the analog output type, turn off the analog output, learn the active analog output type or set the minimum and maximum values which the device will take into consideration when generating an analog output.

"HIGHEST"

The current value corresponding to the maximum value of the selected analog output type is set in this menu. This value can be entered between -/+ Shunt Current values.

Example: When the analog output type is selected as 0 - 20 mA and **"HIGHEST"** value is set as 100A, current value on the analog output will be 20 mA when the measured current becomes 100A.

"LOWEST"

The current value corresponding to the minimum value of the selected analog output type is set in this menu. This value can be entered between -/+ Shunt Current values.
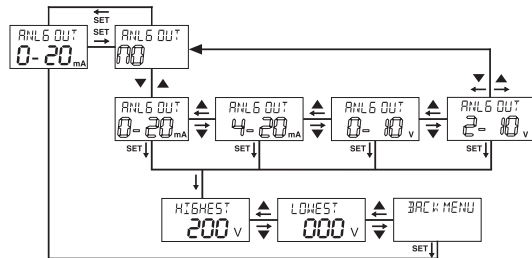
Example: When the analog output type is selected as 0 - 20 mA and **"LOWEST"** value is set as 10A, current value on the analog output will be 0 mA when the measured current becomes 10A.
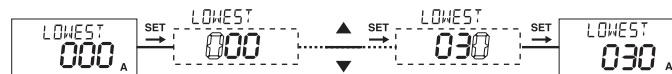
2.2.5 "RS-485" Serial Communication Setting Menu

All measured parameters can be transferred via RS485 line with MODBUS protocol and menus can be set remotely.

Note: Communication feature is available only on **DCA-10S/10CS/11S/11CS** models. In order for the communication to be accomplished; Address, Baudrate and Parity values must be entered to the device correctly. RS – 485 menu has 3 sub-menus. **"ADDRESS" , "BAUDRATE" , "PARITY".**
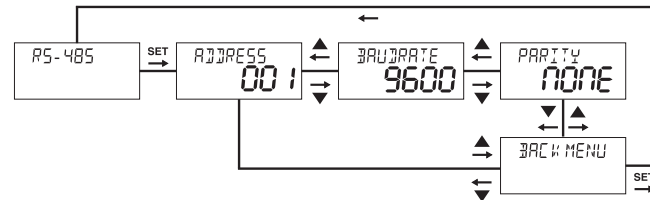
"ADDRESS" Address Setting
Address information can be entered between 1 and 247.

"BAUDRATE" Baudrate Settings
Enter one of the 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps values as stated in the communication software.
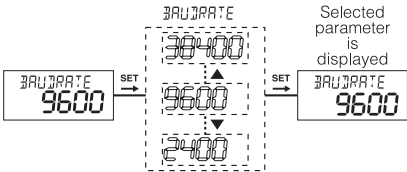
"PARITY" Parity Setting
Parity can be entered as none, odd or even.
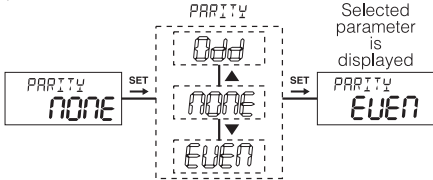
MODBUS RTU PROTOCOL
Standart MODBUS RTU message is shown below.

T	ADDRESS 8 BIT	FUNCTION 8 BIT	DATA N x 8 BIT	CRCH	CRCL	T

The T times corresponds to a time in which data must not be exchanged on the communication bus to allow the connected devices to recognize the end of one message and the beginning of another. This time must be at least 3.5 characters at the selected baud rate. Adress range (1-247) is address of the connected device. The data field contains data sent to the slave by master or data sent to master by slave. CRC is a error check method by using MODBUS RTU protocol and consists of 2 bytes.

Modbus Functions:

03H	READ HOLD REGISTERS	10H	PRESET MULTIPLE REGISTERS
06H	PRESET SINGLE REGISTER	2BH	READ DEVICE INFO

Read Hold (03H) function is used for reading the measured parameter (intantenaous measurement value, minimum and maximum measurement values) and other setting values of the device. If any register other than this area has been tried to read, the device will send an error message. For example; below message can be sent to read the measured current value:

01 Device Address	03 Function	40 MSB Address	00 LSB Address	00 Register number MSB	01 Register number LSB	91 CRC MSB	CA CRC LSB

Preset Single Register (06H) function is used for change device settings (shunt voltage/current etc.) and resetting the measured minimum/maximum values.
For example; below message can be sent to set the shunt voltage value to 100:

01 Device Address	06 Function	80 MSB Address	00 LSB Address	00 Data MSB	64 Data LSB	A1 CRC MSB	E1 CRC LSB

Preset Multiple register (10H) function is used for changing more than one register value. For example; below message can be sent to set the shunt voltage and shunt current values to 100:

01 Device Address	10 Function	80 MSB Addr.	00 LSB Addr.	00 Register number MSB	02 Register number LSB	04 Byte count	00 Data MSB	64 Data LSB	00 Data MSB	64 Data LSB	D2 CRC MSB	ED CRC LSB

Read device info (2BH) function is used to learn the manufacturer name, the device code, hardware version and software version. The query packet to read the device info is as following:
01 2B 0E 01 00 70 77

2.2.6 "RESET" Reset Menu

Minimum and maximum values among measured current values are stored on the device. Reset menu is used in order to delete these values. There are 2 sub-menus under Reset menu: **"RESET MIN", "RESET MAX"**. To see the measured minimum and maximum values, refer to the **"Special Functions for Buttons"** section of this user manual.

NOTE: Stored values are not affected from power outages. After you select YES option under the value that you want to reset and approve the changes when you exit or a zero (0) value is written into the addresses that these values are stored, measured minimum and maximum values are deleted.
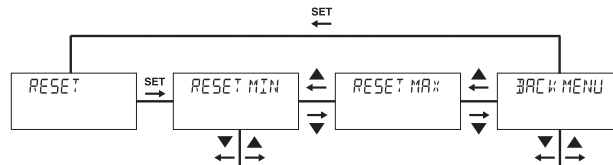
"RESET MIN" Minimum Value Reset Menu
It is the menu where stored minimum current value is deleted.
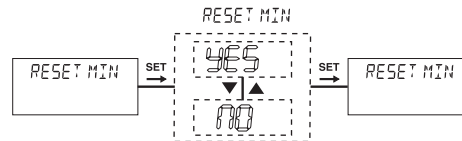
"RESET MAX" **Maximum Value Reset Menu**
It is the menu where stored maximum current value is deleted.
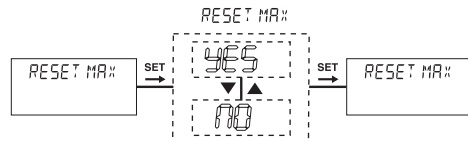
2.2.7 "DISPLYSET" Display Setting Menu
Settings about the device display are done in this menu. Display setting menu has 2 sub-menus: **"BACKLIGHT", "CONTRAST".**
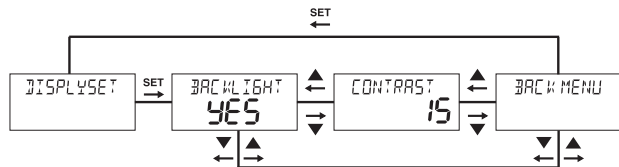
"BACKLIGHT" **LCD Backlight Setting Menu**
Backlight feature of the device is configured in this menu. Available choices are as following: "NO" Off. "YES" Continuously on. "30 s" On for 30 seconds, "60 s" On for 1 minute, "300 s" On for 5 minutes, "900 s" On for 15 minutes. Backlight turns off after the selected time if no button is pressed at the end of that time.
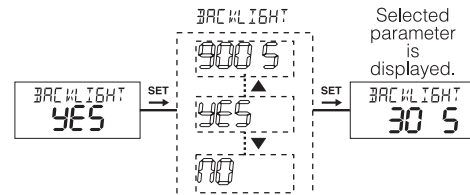
"CONTRAST" **Contrast Setting Menu**
Contrast of the device display is set in this menu. It can be set to a value between "00" and "15".
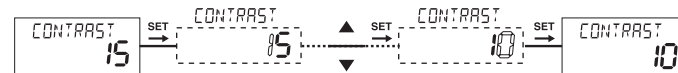
2.2.8 "LANGUAGE" Language Setting Menu
Language of the device is set in this menu. There are 5 language options as **"Tr"** Turkish, **"Eng"** English, **"dE"** German, **"ESP"** Spanish and "Fr" French.
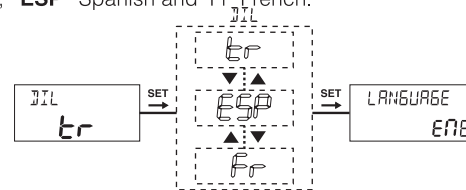
2.2.9 "FCTRY SET" Factory Setting Menu

Factory settings are loaded in this menu. A 4 digit password is asked when entering this menu. If password protection is active, the password isn't asked again when entering this menu because it was entered during entering the main menu. If "YES" option is selected in this menu and "SAVE" confirmation is approved at the exit of main menu, factory settings are loaded (Refer to: Factory Default Values).
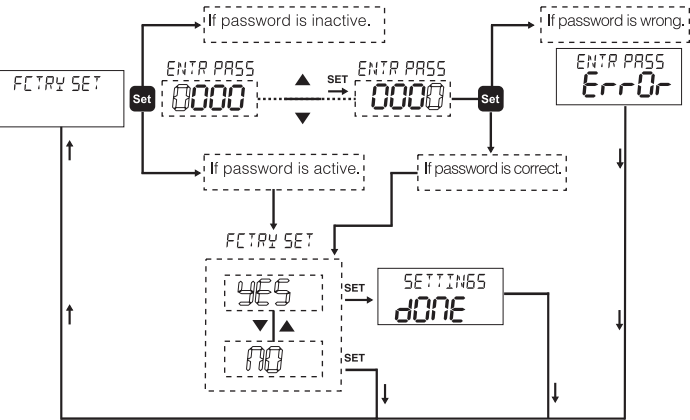
NOTE: When factory settings are loaded, language setting stays unchanged. The language will be the same as the on selected last.

2.2.10 "SECURITY" Security Setting Menu

Device password settings are done in this menu. There are 2 sub-menus under SECURITY menu. **"PASS ACTV", "PASS CHNG"**. Password activation and changing operations are done under these menus. Factory default password is "0000".
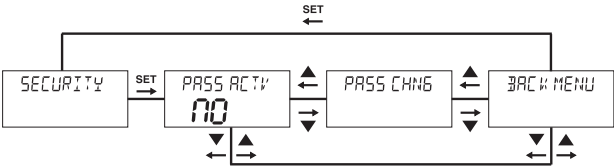
"PASS ACTV" Password Activation Menu

Password protection is activated or deactivated in this menu.
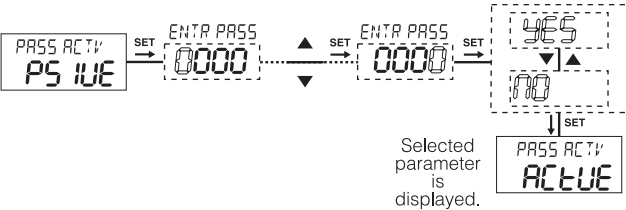
Selected parameter is displayed.

"CHNG PASS" Change Password Menu

Password is changed in this menu.
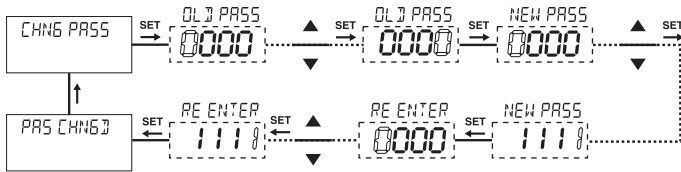
2.2.11 "INFO" Menu

This menu display shows software and hardware version as well as serial number of the device. It has 3 sub-menus.. "SOFT VER", "HARD VER", "SERI NO" .

"SOFT VER"
This menu display shows the software version of the device.

"HARD VER"
This menu display shows the hardware version of the device.

"SERI NO"
This menu display shows the serial number of the device.

2.2.12 "ESCAPE" Exiting Main Menu

It is used to exit the main menu. If any changes has been made in the menus, a confirmation is asked to save those changes. If there are no changes, measurement results are displayed without a confirmation.
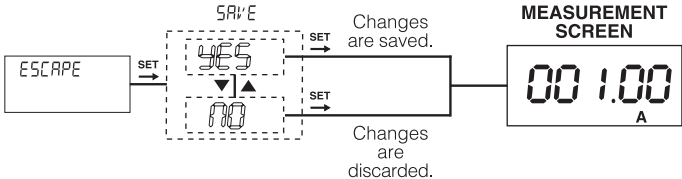
3. INSTALLATION
3.1. DIMENSIONS AND INSTALLATION

Dimensions

Panel Cutout Dimensions

48mm

96mm

TYPE PR 20 (48x96)

44mm

91mm

TYPE PR 20 (48x96)
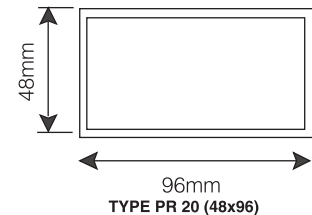
Control Panel Area Dimensions

Wall

54mm

43mm

50mm   63mm

TYPE PR 20 (48x96)

3.2. CONNECTION DIAGRAM

RELAY 1   RELAY 2   V   GND   A   TR   B   A   GND
  1   2   3   4   *   5   6   7   **   8   9   10   11   ***

RS-485

1A
+ 10-56VDC *****
-

12   13   14   15   16
+ Iin ⎓ -   Un ≈

85-265 V AC/DC ****
1A

DC SOURCE   +   500 A   60 mV   LOAD

ENTES   CI 0.5

-
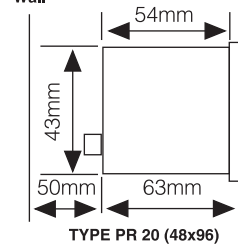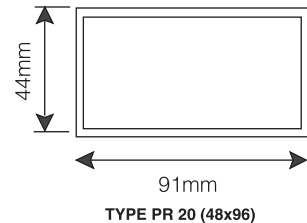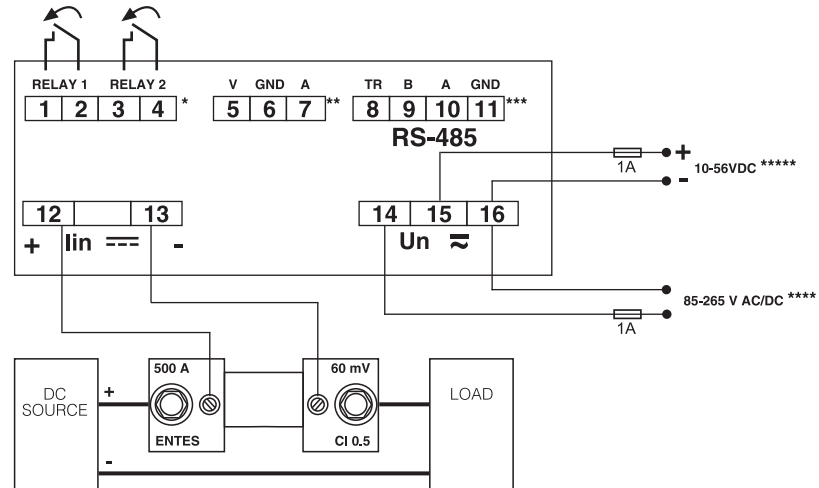
*   Only for DCA-10C/10CS/11C/11CS
**   Only for DCA-10A/11A
***   Only for DCA-10S/10CS/11S/11CS
****   Only for DCA-10/10A/10C/10S/10CS 85-265 VAC/DC
*****   Only for DCA-11/11A/11C/11S/11CS/10-56VDC

3.3. PC CONNECTION

MAX. 31 DEVICES CAN BE CONNECTED ON THE SAME LINE

MAX. 1200 mt.

RS-485 / RS-232 Converter

B
A
GND

PC

TR B   A GND   TR B   A GND   TR B   A GND

DCA-10S/10CS -31.
DCA-11S/11CS -31.
DCA-10S/10CS -2.
DCA-11S/11CS -2.
DCA-10S/10CS -1.
DCA-11S/11CS -1.

247 DEVICES CAN BE CONNECTED ON THE SAME LINE BY USING A REPEATER

MAX. 1200 mt.   MAX. 1200 mt.

RS-485 / RS-232 Converter

B
A
GND

PC

DCA-10S/10CS -247.
DCA-11S/11CS -247.

REPEATER

DCA-10S/10CS -31. DCA-10S/10CS -2.
DCA-11S/11CS -31. DCA-11S/11CS -2.
DCA-10S/10CS -1.
DCA-11S/11CS -1.

4. FACTORY DEFAULT VALUES:
Alarms:(DCA-10C/10CS/11C/11CS)
1.Alarm:

Alarm Status	: Passive
Latch	: Off
Trip	: Off
Contact Position (Output Inverse)	: Off
Alarm Type	: High Alarm
High Alarm Value	: 100A
Low Alarm Value	: 10A
High Alarm Hysteresis	: 10
Low Alarm Hysteresis	: 5A
High Alarm On Delay (d_on_time)	: 20s
High Alarm Off Delay (d_off_time)	: 10s
Low Alarm On Delay (d_on_time)	: 20s
Low Alarm Off Delay (d_off_time)	: 10s

2.Alarm:

Alarm Status	: Passive
Latch	: Off
Trip	: Off
Contact Position (Output Inverse)	: Off
Alarm Type	: High Alarm
High Alarm Value	: 100A
Low Alarm Value	: 10A
High Alarm Hysteresis	: 10
Low Alarm Hysteresis	: 5

High Alarm On Delay (d_on_time)   : 20s
High Alarm Off Delay (d_off_time)   : 10s
Low Alarm On Delay (d_on_time)   : 20s
Low Alarm Off Delay (d_off_time)   : 10s

Shunt Parameters:

Shunt Current   : 150A
Shunt Voltage   : 150 mV

RS 485: (DCA-10S/10CS/11S/11CS)

Address   : 1
Baudrate   : 9600
Parity   : None

Analog Output: (DCA-10A/11A)

Analog Output   : 0 - 20 mA
Assign Hi   : 150A
Assign Lo   : 0A

Period   : 1 (second)

Display

Backlight   : On
Contrast   : 15

Security

Password Protection   : Off
Password   : 0

5. TECHNICAL FEATURES:

Operating Voltage (Un)   :85-265 VAC/DC (DCA-10/10A/10C/10S/10CS),
                                     10-56 VDC (DCA-11/11A/11C/11S/11CS)
Frequency   :50/60 Hz (DCA-10/10A/10C/10S/10CS)
Supply Input Power Consumption :< 4 VA
Measuring Input Power Consumption :< 1 VA
Measuring Input Resistance (Rin) :< 1K
Iin   :+/- 150mV
Measuring Current Range   : +/-10000A
Accuracy   :0.5% ±1 Digit [(10% - 100%) x full scale] **
Shunt Current   :1A- 10000A (10kA)
Shunt Voltage   : 50mV - 150mV
Relay Outputs (2 pieces)   :2 NO, 5A 1250 VA (DCA-10C/10CS/11C/11CS)
Communication   :MODBUS RTU (RS-485) Programmable.(DCA-10S/10CS/11S/11CS)
    Baudrate   :2400 - 38400
    Address   :1-247
    Parity   :None, Odd, Even
Analog Output   :(DCA-10A/11A)
    Analog Voltage Output   :0-10 V or 2-10 V
    Load Resistance   :>= 1K2 ohm
    Update Period   :100ms (milliseconds).
    Analog Current Output   :0-20 mA or 4-20 mA
    Load Resistance   :<= 500ohm
    Update Period   :100ms (milliseconds).
    Accuracy   :±0.01 FS%

Period : 1 - 600 seconds

Ambient Temperature : -20 ... 70°C

Display : 2.5 inches Backlit LCD

Dimensions : PR-20

Device Protection Class : Double Insulation - Class II (▣)

Casing Protection Class : IP 40

Terminal Protection Class : IP 00

Wire Width (For Terminals) : 2.5mm2

Casing Material : Nonflammable

Installation Type : Flush Mounting (PR-20)

Weight : 0.240 kg

Installation Class : Class III

Panel Cutout Dimensions : 48X96 mm (PR-20)

** Measurement accuracy may change when measured waveform is not pure DC. (Measuring error may increase to 5% for half-wave and full-wave rectified AC signals. Capacitive filter usage is suggested to increase the precision for measuring such signals.) It is recommended to use "Capacitive filter" in order to improve accuracy of measurements.

6. REGISTER TABLE:

Register Table
Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x0000	DC Voltage Value	R	+/- 15000	mV	0,01	signed int
0x0001	Max. Measurement Value	R/W	+/- 15000	mV	0,01	signed int
0x0002	Min. Measurement Value	R/W	+/- 15000	mV	0,01	signed int
0x8000	Shunt Current	R/W	1 – 10000	A	1	unsigned int
0x8001	Shunt Voltage	R/W	50-150	mV	1	unsigned int
0x8002	Alarm 1 Activation	R/W	0 – 1 0 ---> Alarm Inactive 1 ---> Alarm Active	-	1	unsigned int
0x8003	Alarm 1 Latch Function	R/W	0-1 0 ----> Latch Inactive 1 ----> Latch Active	-	1	unsigned int
0x8004	Alarm 1 Trip Function	R/W	0-1 0 ----> Trip Inactive 1 ----> Trip Active	-	1	unsigned int

Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x8005	Alarm 1 Contact Position	R/W	0-1 0 ----> Normal 1 ----> Inverted	-	1	unsigned int
0x8006	Alarm 1 Alarm Type	R/W	0-2 0 ---> High Protection Active 1 ---> Low Protection Active 2 ---> Range Protection Active	-	1	unsigned int
0x8007	Alarm 1 High Warning Value	R/W	+/- Shunt Current	m A	1	long int
0x8009	Alarm 1 Low Warning Value	R/W	+/- Shunt Current	m A	1	long int
0x800B	Alarm 1 High Hysteresis	R/W	0- 20	%	1	unsigned int
0x800C	Alarm 1 Low Hysteresis	R/W	0- 20	%	1	unsgined int
0X800D	Alarm 1 High Alarm ON Delay	R/W	0-9999	second	0,1	unsigned int
0x800E	Alarm 1 High Alarm OFF Delay	R/W	0-9999	second	0,1	unsgined int

Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x800F	Alarm 1 Low Alarm ON Delay	R/W	0-9999	second	0,1	unsigned int
0x8010	Alarm 1 Low Alarm OFF Delay	R/W	0-9999	second	0,1	unsigned int
0x8011	Alarm 2 Activation	R/W	0-1 0 ---> Protection Inactive 1 ---> Protection Active	-	1	unsigned int
0x8012	Alarm 2 Latch Function	R/W	0-1 0 ----> Latch Inactive 1 ----> Latch Active	-	1	unsigned int
0X8013	Alarm 2 Trip Function	R/W	0-1 0 ----> Trip Inactive 1 ----> Trip Active	-	1	unsigned int
0X8014	Alarm 2 Contact Position	R/W	0-1 0 ----> Normal 1 ----> Inverted	-	1	unsigned int
0X8015	Alarm 2 Alarm Type	R/W	0-2 0 ---> High Protection Active 1 ---> Low Protection Active 2 ---> Range Protection Active	-	1	unsigned int

Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x8016	Alarm 2 High Warning Value	R/W	+/- (Shunt Current)	A	1	long int
0x8018	Alarm 2 Low Warning Value	R/W	+/- (Shunt Current)	A	1	long int
0x8001A	Alarm 2 High Hysteresis	R/W	0- 20	%	1	unsgined int
0x8001B	Alarm 2 Low Hysteresis	R/W	0- 20	%	1	unsgined int
0x8001C	Alarm 2 High Alarm ON Delay	R/W	0-9999	second	0,1	unsigned int
0x8001D	Alarm 2 High Alarm OFF Delay	R/W	0-9999	second	0,1	unsigned int
0x8001E	Alarm 2 Low Alarm ON Delay	R/W	0-9999	second	0,1	unsigned int
0x8001F	Alarm 2 Low Alarm OFF Delay	R/W	0-9999	second	0,1	unsigned int

Addres (HEX)	Description	W/R	Alarm Status	Unit	Multiplier	Format
0x8020	Alarm1 Status	R	0: Alarm doesn't count 1: High Alarm 2: Low Alarm	-	1	unsigned int
0x8021	Alarm1 Status	R	0: Alarm doesn't count 1: High Alarm 2: Low Alarm	-	1	unsigned int

Addres (HEX)	Açıklama	W/R	Aralık	Birim	Çarpan	Format
0x8022	Analog Output Type/Range	R/W	0 – 4 0 OUTPUT INACTIVE 1 OUTPUT TYPE VOLT RANGE = 0-10 V 2 OUTPUT TYPE VOLT RANGE = 2-10 V 3 OUTPUT TYPE CURRENT RANGE = 0-20 mA 4 OUTPUT TYPE CURRENT RANGE = 4-20 mA	-	1	unsigned int
0x8023	Assign H	R/W	- / + (Shunt Current)	mA	1	long int
0x8025	Assign Lo	R/W	- / + (Shunt Current)	mA	1	long int
0x8027	Comm. Address	R/W	1 – 247	-	1	unsigned int
0x8028	Baud Rate	R/W	0 — 4 0 –> 2400 1 --> 4800 2 --> 9600 3 --> 19200 4 --> 38400	bps	1	unsigned int
0x8029	Parity	R/W	0 – 2 0 ---> None, 1 ----> Odd, 2 ---> Even	-	1	unsigned int
0x802A	Pass. Protection	R/W	0---> Off —1----> On	-	1	unsigned int
0x802B	Password	R/W	0-9999	-	1	unsigned int

Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x802C	Backlight Status	R/W	0 – 4 0----> Backlight Off 1----> Backlight On continuously 2----> Backlight On for 30 seconds 3----> Backlight On for 1 minute 4 ---->Backlight On for 5 minutes 5 ---->Backlight On for 15 minutes	-	1	unsigned int
0x802D	Contrast	R/W	0-15			
0x802E	Average Period	R/W	1 – 600	second	1	unsigned int
0x802F	Language	R/W	0 – 4 0：TR 1：ENG 2：DE 3：FR 4：ESP	-	1	unsigned int

32 Bit Register Table						
Address (HEX)	Description	W/R	Range	Unit	Multiplier	Format
0x4000	DC Current Value	R	+/- 10000000	A	0,001	long int
0x4002	Max. Measurement Value	R/W	+/- 10000000	A	0,001	long int
0x4004	Min. Measurement Value	R/W	+/- 10000000	A	0,001	long int

EC00	DEVICE ID	R	0xB601-0xB604	-	1	unsigned int
EC01	DEVICE ID && VERSION NO	R	0x0111 – 0x01FF	-	1	unsigned int
EC02	SERIAL NO	R	0x0000 – 0xFFFF	-	1	unsigned int
EC03				-	1	unsigned int
EC04	SOFTWARE VERSION	R		-	1	unsigned long
EC06	HARDWARE VERSION	R		-	1	unsigned long
EC08	MODBUS TABLE VERSION	R		-	1	unsigned long
EC0A	PRODUCTION DATE	R		-	1	unix time
EC0C	CALIBRATION DATE	R		-	1	unix time

DEVICE ID	DEVICE TYPE	DEVICE ID	DEVICE TYPE	DEVICE ID	DEVICE TYPE	DEVICE ID	DEVICE TYPE
B60101	DCA-10	B60201	DCV-10	B60301	DCA-11	B60401	DCV-11
B60102	DCA-10A	B60202	DCV-10A	B60302	DCA-11A	B60402	DCV-11A
B60103	DCA-10S	B60203	DCV-10S	B60303	DCA-11S	B60403	DCV-11S
B60104	DCA-10C	B60204	DCV-10C	B60304	DCA-11C	B60404	DCV-11C
B60105	DCA-10CS	B60205	DCV-10CS	B60305	DCA-11CS	B60405	DCV-11CS

Supported Modbus Functions:

03H	READ HOLD REGISTERS
06H	PRESET SINGLE REGISTER
10H	PRESET MULTIPLE REGISTERS
2BH	READ DEVICE INFO

Data Type	Size
signed int	16 bit
unsigned int	16 bit
long int	32 bit
unsigned long	32 bit

When a reading operation from addresses that are not present on the device is done, 0 (zero) value will be read. When a writing operation to addresses that are not present on the device is done, no writing is done and no error code is returned.
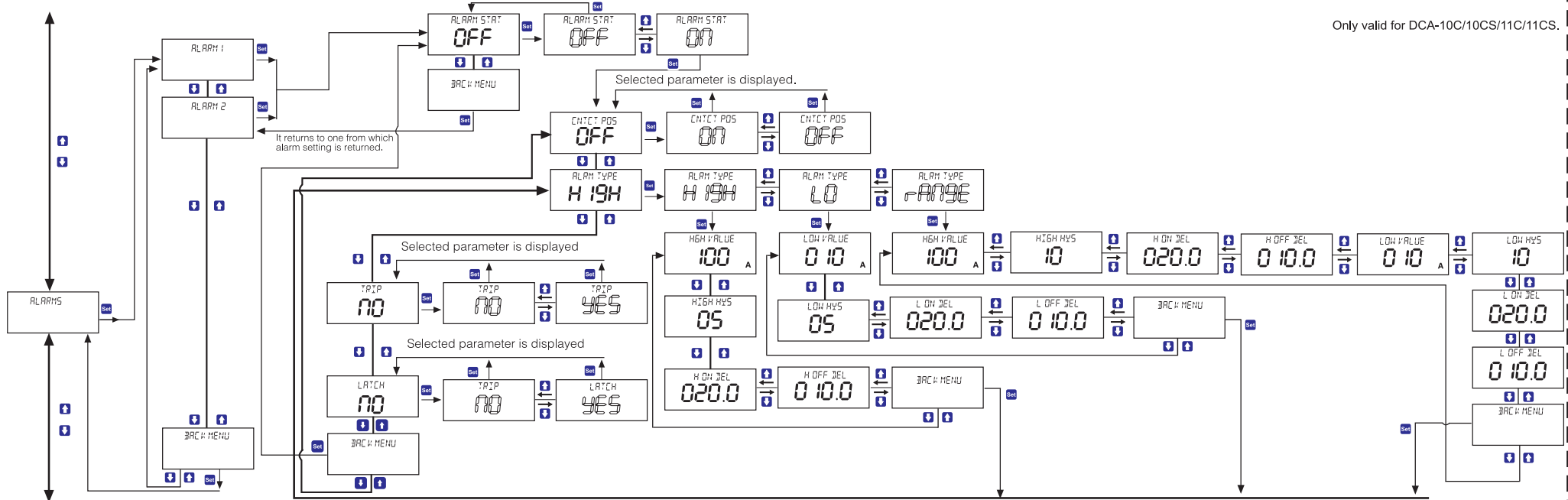
7. MENU MAP

ALARMS

ALARM 1 — Set
ALARM 2 — Set

It returns to one from which alarm setting is returned.

BACK MENU

ALARM STAT
OFF — Set

ALARM STAT
OFF — Set

ALARM STAT
ON

BACK MENU

Selected parameter is displayed.

CNTCT POS
OFF — Set

CNTCT POS
ON

CNTCT POS
OFF

ALARM TYPE
HIGH — Set

ALARM TYPE
HIGH

ALARM TYPE
LO

ALARM TYPE
rANGE

Selected parameter is displayed

TRIP
NO — Set

TRIP
NO

TRIP
YES

Selected parameter is displayed

LATCH
NO — Set

TRIP
NO

LATCH
YES

BACK MENU

HIGH VALUE
100 A

HIGH HYS
05

H ON DEL
020.0

H OFF DEL
010.0

BACK MENU

LOW VALUE
010 A

LOW HYS
05

L ON DEL
020.0

L OFF DEL
010.0

BACK MENU

HIGH VALUE
100 A

HIGH HYS
10

H ON DEL
020.0

H OFF DEL
010.0

LOW VALUE
010 A

LOW HYS
10

L ON DEL
020.0

L OFF DEL
010.0

BACK MENU

47

48

← Last entered value is displayed. ←

← Last entered value is displayed. ←

Last entered value is displayed.

Last selected parameters is displayed.

Last selected parameters is displayed.

RESET → RESET MIN ⇄ RESET MAX → BACK MENU

RESET MIN — YES / NO

RESET MAX — YES / NO

DISPLAYSET → BACKLIGHT YES ⇄ CONTRAST 15 → BACK MENU

BACKLIGHT — 900 S / YES / NO

CONTRAST — 15 → 10

Last entered value is displayed.

Selected parameter is displayed.

51

DIL tr

← Ekranda seçilmiş parametre görünür. ←

DIL: tr — ENG — dE — ESP — Fr

FBRK AYAR

Sifre etkin degilse

SFR GIR 0000 → SFR GIR 0000

Sifre yanlis ise — SFR GIR hAtA

Sifre etkin ise

Sifre dogru ise

FBRK AYAR — EVEt / HAY

AYARLAR bItt1

52

SECURITY

PASS ACTV
no

PASS CHNG

BACK MENU

ENTR PASS
0000

ENTR PASS
0000

If password is wrong.

ENTR PASS
ErrOr

If password is correct.

PASS ACTV
no
YES

Selected parameter is displayed.

OLD PASS
0000

OLD PASS
0000

If password is correct.

NEW PASS
0000

NEW PASS
1111

If password is wrong.

If password is wrong.

OLD PASS
ErrOr

AGAIN
ErrOr

PAS CHNGD

AGAIN
1111

AGAIN
0000

INFO

SOFT VER
2.00.00

HARD VER
2.00.00

SERI NO
00001

BACK MENU

ESCAPE

SAVE
YES
no

Changes are saved.

Changes are discarded.

120.00
A