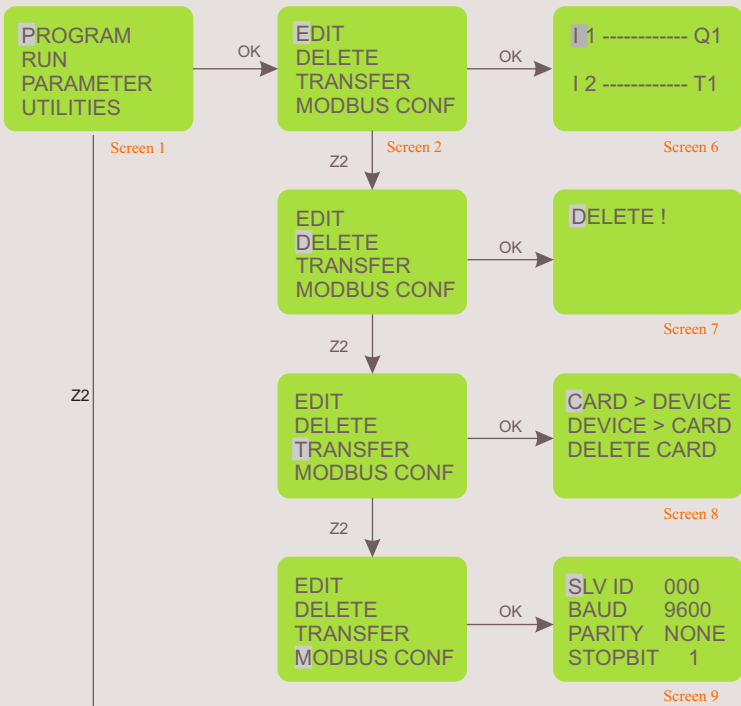


Programming the Altech Smart Relay at the Device: Menu & Functions

PROGRAM



Programming and other settings in Altech Smart Relay can be done using the software as well as on the device itself with the help of the keypad & display.

When the connections are made and the device is powered ON, screen 1 is displayed on the device. By default the cursor will blink on the 'PROGRAM' option. Using the Up, Down keys, user can select between any of the options.

When the cursor is on the PROGRAM option and OK key is pressed, then screen 2 is displayed.

When screen 2 is being displayed, the cursor is on the 'EDIT' option. Press the OK key to enter this option & screen 6 will be displayed. Similarly by pressing down key and OK, one can enter the other functions viz. "DELETE", "TRANSFER", "MODBUS CONF" and screen 7,8 and 9 will be displayed respectively

EDIT

This function allows the user to enter a new program or edit an existing program. If Password is set, then this function is accessible only with the correct password.

DELETE

This function will clear the entire program stored in the Altech Smart Relay. If password is set, then this function will work only with correct password.

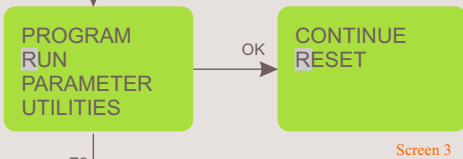
TRANSFER

This function will transfer the program from device to memory card or vice versa. Program data on memory can also be deleted in this mode.

MODBUS CONFIG

This function will set Mod bus Slave configuration data. The user can set the following communication parameters:
 •SLAVE ID, BAUD RATE, PARITY, STOP BIT

RUN



When screen 1 is being displayed, press the down key to shift the cursor to the RUN option and press OK key to enter it. Screen 3 will be displayed.

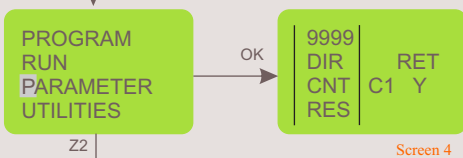
RESET

The RESET Mode resets all the previous states of Inputs/Outputs, clears timer and counter states, starts afresh.

CONTINUE

The CONTINUE Mode does not change the states of the Inputs/Outputs and special functions and continues with the execution of the program.

PARAMETERS

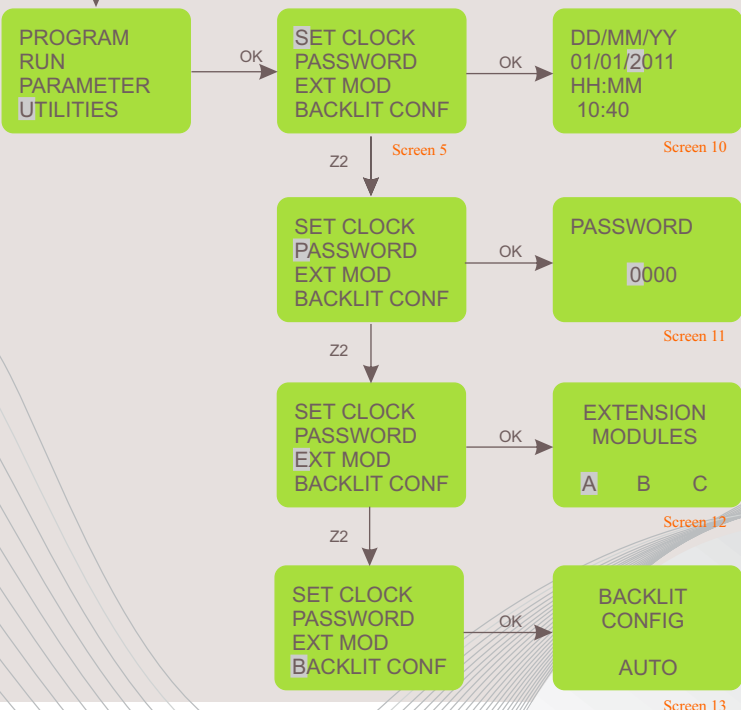


When the cursor is on PARAMETERS option and OK is pressed then screen 4 will be displayed.

PARAMETERS

This function displays and allows the user to change parameters of special functions like timer, counter, Time switch (clock), compare counters and analog functions used in the program. This may be password protected and may have additional individual lock for each parameter.

UTILITIES



When the cursor is on the UTILITIES option and OK key is pressed, then screen 5 is displayed.

When screen 5 is being displayed, the cursor is on the 'SET CLOCK' option. Press the OK key to enter this option & screen 10 will be displayed. Similarly by pressing down key and OK, one can enter the other functions viz. "PASSWORD", "EXT MOD", "BACKLIT CONF" and screen 11,12 and 13 will be displayed respectively

SET CLOCK

This function is used to set the day and time: Day of the week, Date, Hours-Minutes. This function is available only on Altech Smart Relay.

PASSWORD

This function allows setting of password. If password is set, certain functions like Program, Parameters are protected and are accessible only when correct password is entered. The Password can be set or removed; the status is indicated by the open or closed lock symbol.

EXTENSION MODULE

This function allows the selection of the Extension Modules (A/B/C). Maximum 3 Extension Modules can be connected to the Altech Smart Relay's Main Unit. In the ASR-Soft on PC, extension modules have to be chosen using the "Configuration" menu.

BACKLIT CONF

This function allows the setting of backlight in either On, Off or Auto mode. In the Auto mode, the backlight comes up only when a key is pressed on the device and remains for 10 seconds. If the ON or OFF modes are selected the backlight will be permanently ON or OFF respectively.

Ladder Programming Elements / Function Blocks

In ladder programming, the ladder elements / Functional Blocks are connected to create a ladder for any application. The following section gives the description of each element that is used for ladder programming.

INPUTS

Altech Smart Relay provides 2 types of Inputs viz. Digital & Analog
AC Model: Digital Inputs (1 - 8)
DC Model: Digital Inputs (1 - 6), Analog Inputs (V1, V2)8

I1, I2, I8	Normally Open Contact ('NO' Contact)	Base Module
J1, J2, J8		Extension Module 1
K1, K2, K8		Extension Module 2
L1, L2, L8		Extension Module 3

i1, i2, i8	Normally Closed Contact ('NC' Contact)	Base Module
j1, j2, j8		Extension Module 1
k1, k2, k8		Extension Module 2
l1, l2, l8		Extension Module 3

OUTPUTS

Altech Smart Relay provides Digital Outputs: Base Module (4), Extension Module (4)
The outputs can be configured as:
I. State Change (Contactor), ii. Level Change (Remote Control), iii. Bi-stable (Set Reset)

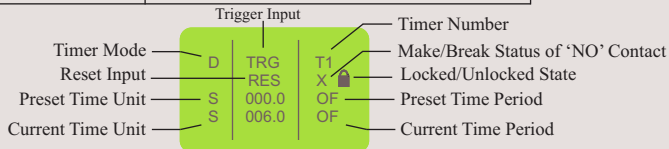
Q1, Q2, Q4	Normally Open Contact ('NO' Contact)	Base Module
U1, U2, U4		Extension Module 1
V1, V2, V4		Extension Module 2
W1, W2, W4		Extension Module 3

q1, q2, q4	Normally Closed Contact ('NC' Contact)	Base Module
u1, u2, u4		Extension Module 1
v1, v2, v4		Extension Module 2
w1, w2, w4		Extension Module 3

TIMERS

Altech Smart Relay provides 16 Timers which can be configured as:
I. ON Delay, ii. Off Delay, iii. Single Pulse iv. Symmetric/Asymmetric v. Equal/Unequal On/Off 2, vi. Equal/Unequal Off/On 2, vii. Leading Edge Impulse 1, viii. Leading Edge Impulse 2 ix. Trailing Edge Impulse 1, x. Trailing Edge Impulse 2 xi. Delayed Impulse, xii. Impulse On/Off, xiii. Signal Off/On.

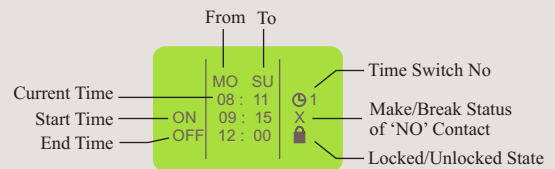
T1, T2, T16	Timer Coil / Normally Open (NO) Contact
t1, t2, t16	Normally Closed (NC) Contact



TIME SWITCHES

Altech Smart Relay provides 16 Time Switches which can be used for daily or weekly applications

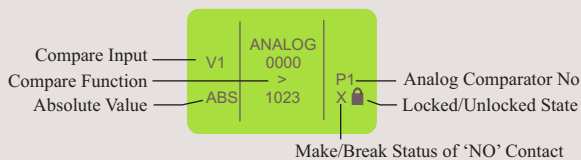
Ⓞ1, Ⓞ2, Ⓞ16	Normally Open (NO) Contact
Ⓞ1, Ⓞ2, Ⓞ16	Normally Closed (NC) Contact



ANALOG COMPARATORS

Altech Smart Relay provides 12 Analog Comparators which can be used for comparison between values of two analog signals or between an analog signal and any absolute value

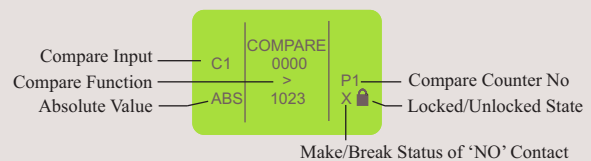
A1, A2, A12	Normally Open (NO) Contact
a1, a2, a12	Normally Closed (NC) Contact



COMPARE COUNTERS

Altech Smart Relay provides 16 Compare Counters which can be used for comparison between values of two counters or between a counter and any absolute value
I. Up Counter, ii. Down Counter

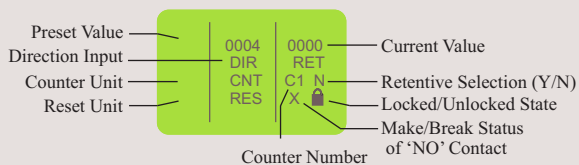
P1, P2, P16	Normally Open (NO) Contact
p1, p2, p16	Normally Closed (NC) Contact



COUNTERS

Altech Smart Relay provides 16 Counters which can be configured as:
I. Up Counter, ii. Down Counter

C1, C2, C16	Counter Coil / Normally Open (NO) Contact
c1, c2, c16	Normally Closed (NC) Contact



AUXILIARY RELAYS

Altech Smart Relay provides 64 Auxiliary relays which can be used to expand a rung from one line to another line.

It can be configured as:

I. State Change (Contactor), ii. Level Change (Remote Control), iii. Bi-stable (Set Reset)

M1, M2, M64	Auxiliary Coil / Normally Open (NO) Contact
m1, m2, m64	Normally Closed (NC) Contact

Z-KEYS

Z-Keys are navigation keys provided on device front facia. They behave exactly like the physical inputs (Discrete inputs). The only difference is that they do not correspond to Altech smart relay connection terminals, but to the four gray buttons on the front panel.

Z1, Z2, Z4	Normally Open (NO) Contact
z1, z2, z4	Normally Closed (NC) Contact

Z-Keys can be used as navigation keys for current displayed menu. To use Z-Keys go to RUN Screen or RUN LADDER Screen and Press ALT which will display the Z-Key Screen. Then Press Z1 - Z4.

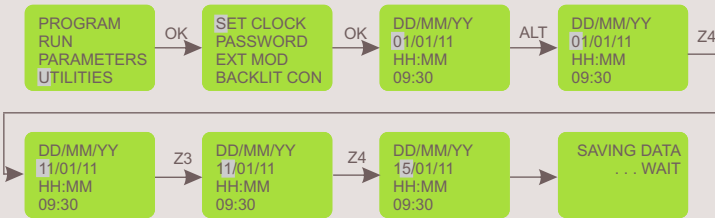
SOFT TEXT MESSAGES

Altech Smart Relay provides 16 Soft Text Message blocks which can be used to display text messages, the Preset Value and Current Value of any Special Function Block or the Current Date and time

X1, X2, X16	Used for viewing Alarms, HMI Functionality
-------------------	--

Setting the Clock

1. Select the "UTILITIES" option from the Main Menu and press OK.
 2. Select the "SET CLOCK" option from the Sub Menu and press OK.
 3. The cursor will blink on the first digit of the date, press ALT to edit the digit
 4. The digit will now start blinking
 5. Using Up(Z4) and Down(Z2) keys select the appropriate digit.
 6. Now press Z3 to edit the other digit and using Up & Down keys select the digit.
 7. Now press OK to confirm the changes that have been made.
 8. Repeat the same procedure to set the month, year, hour and minutes.
- Once all the parameters have been set, press OK to save the changes and exit.

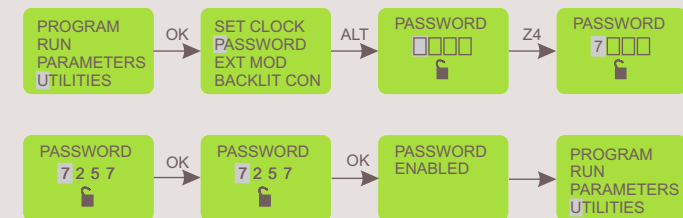


PASSWORD

The password secures access to the following main menu options: "PROGRAM", "PARAMETERS" and "UTILITIES". Password feature is disabled during Ladder Run Mode. User can view/edit SFB data during ladder Run mode if the "LOCK/UNLOCK" property is in unlock state. Edited at run time will not be saved permanently in the device. This functionality is provided only to test the system during run time. The password comprises four numeric digits from 0 to 9. Therefore the password can have any value between 0 and 9999.

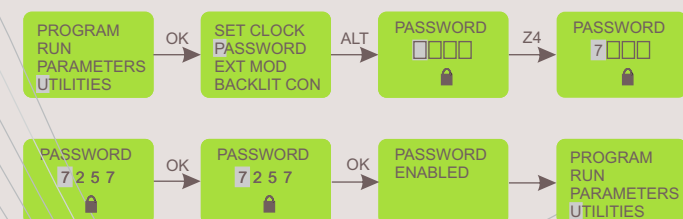
Setting the Password

1. Select the "UTILITIES" option from the Main Menu and press OK.
2. Select the "PASSWORD" option from the Sub Menu and press OK.
3. The unlock symbol means that the password is not yet set.
4. The cursor will blink on the first digit of the date, press ALT to edit the digit
5. The digit will now start blinking
6. Using Up(Z4) and Down(Z2) keys select the appropriate digit.
7. Now press Z3 to edit the other digit and using Up & Down keys select the digit.
8. Repeat the same procedure to set all the 4 digits.
9. Now press OK to confirm the changes that have been made.
10. Again on pressing OK the password is enabled and the Main Menu is displayed



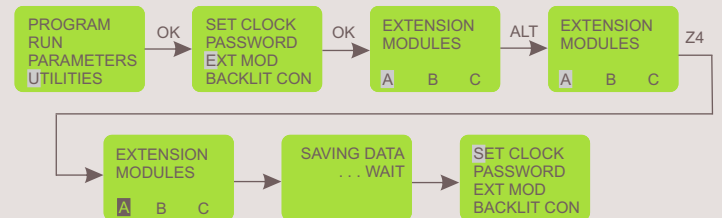
Removing the Password

1. Select the "UTILITIES" option from the Main Menu and press OK.
2. Select the "PASSWORD" option from the Sub Menu and press OK.
3. The lock symbol means that the password is set.
4. The cursor will be blink on the first digit, press ALT to edit the digit
5. The digit will now start blinking
6. Using Up(Z4) and Down(Z2) keys select the appropriate digit.
7. Now press Z3 to edit the other digit and using Up & Down keys select the digit.
8. Repeat the same procedure to set all the 4 digits.
9. Now press OK to confirm the changes that have been made.
10. Again on pressing OK the password is disabled and the Main Menu is displayed



Extension Module Selection

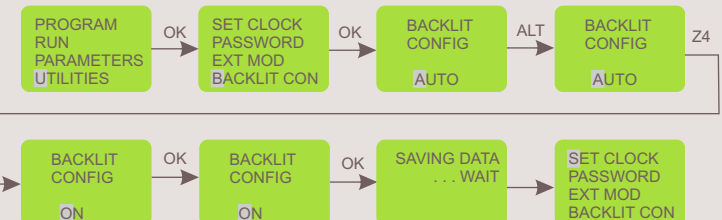
1. Select the "UTILITIES" option from the Main Menu and press OK.
2. Select the "EXT MOD" option from the Sub Menu and press OK.
3. The cursor will be blinking on 'A', press ALT to edit and the 'A' will start blinking.
4. Press Up(Z4) or Down(Z2) keys to select or deselect the extension module.
5. A dark square around 'A' indicates that the module has been selected.
6. Now press OK to confirm the changes that have been made.
7. Repeat the same procedure if the other modules are to be selected.
8. Press OK to save the changes and the 'UTILITIES' sub menu is displayed



If only one extension module is being used and it has been assigned as 'A' on the extension module using the selection switch then make sure that 'A' is selected in the 'EXT MOD' option in the 'UTILITIES' menu. If more than one extension modules are being used then make sure that the modules have been assigned and selected appropriately because this in turn will affect the inputs and the outputs.

Backlit Configuration

1. Select the "UTILITIES" option from the Main Menu and press OK.
2. Select the "BACKLIT CONF" option from the Sub Menu and press OK.
3. The 'Auto' option will be displayed with the cursor blinking on it.
4. Press ALT to edit and the Auto option will start blinking.
5. Press Up(Z4) or Down(Z2) keys to select other options viz. ON, OFF.
6. Now press OK to confirm the changes that have been made.
7. Press OK to save the changes and the 'UTILITIES' sub menu is displayed.



AUTO: In AUTO mode, whenever a key is pressed the backlit will be switched ON and will switched OFF after 10 seconds.

ON: In ON mode, the backlit will be permanently switched ON.

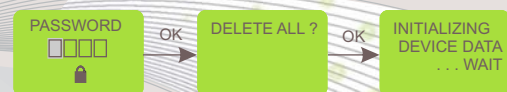
OFF: In OFF mode, the backlit will be permanently switched ON.

Ladder Program Protection

1. If the password is already enabled and user attempts to gain access using wrong password, then an error message is displayed.
2. If four such consecutive attempts are made then user is presented with options to either delete the entire device data or else revert.
3. If the DELETE ALL option is selected, then all device data including Password and Ladder is erased. The user can then re program the Ladder using ASR-Soft and secure it with a new password.



After four wrong attempts of entering the Password this Screen as shown below appears. Pressing OK here, will delete all device data.



After four wrong attempts of entering the Password if user presses ESC, the device will return to last menu mode from where it has entered in PASSWORD screen.

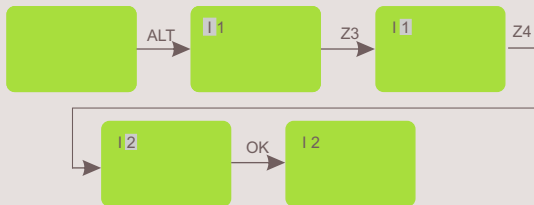
Functions

Creating or Editing a Ladder

To create a new ladder or edit an existing ladder, select the PROGRAM option from the Main Menu by pressing OK. Select the EDIT option to create or edit a ladder.

Inserting a Contact

1. Place the blinking cursor in the required position.
2. Press ALT.
3. Choose the required element using the Up or Down keys.
4. Use the Right Arrow key to move to the number.
5. Choose the number using up or down keys.
6. Press ALT or Right Arrow to accept and to go to next position.



Inserting a Coil

1. Place the blinking cursor in the required position.
2. Press ALT.
3. Choose the required element using the Up or Down keys.
4. Use the Right Arrow key to call-up the number.
5. Choose the number using Up or Down keys.
6. Use the Left Arrow key to move to the type of coil.
7. Choose the type of coil using Up or Down keys.
8. Press ALT or Right Arrow to accept and to go to next position.



Entering a Link

1. Place the blinking cursor next to the desired location.
2. Press OK to start the link ("↔" cursor)
3. Move the cursor to the desired location using the arrow keys.
4. As the cursor moves, the link is drawn.
5. Press OK to exit to normal mode.
6. Repeat this action as many times as necessary to link all the elements together as required



Deleting a Program Line

Move the cursor to the first column of the line, if necessary delete the elements one by one to create a blank line. Press DEL. The line is deleted. It is also possible to delete the entire program stored in the Altech Smart Relay. To do this, call up the "DELETE" option in the Program menu and validate the deletion of all program lines.

Replacing a Link with a Contact

To replace a link with a contact, simply place cursor at the required location and press ALT to enter the contact

Changing an Element

To change an element in an existing program, simply move to the element to change, press ALT and follow the same procedure as when entering a new element

Deleting an Element

To delete an element, simply place the cursor on the required element, then press DEL. Generally, the deleted element must be replaced by a link

Deleting Links between Elements

To delete a link, simply move the cursor next to the desired position, press the OK key to change the cursor and press DEL key. This may delete some of the required connections, which may be restored by the same method as above

Inserting a Program Line

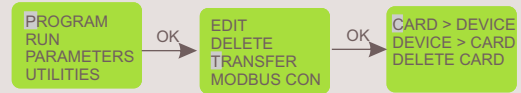
To insert a program line, simply move cursor to the first column of the line immediately above the one to create and press OK.

TRANSFER

The TRANSFER function allows data to be transferred from Memory Card to Altech Smart Relay or vice-versa.

Transferring data to memory card is useful when user wants to load the same program in many Altech Smart Relay units. In this case instead of using PC user can make use of memory card, which is capable of storing one program. This feature is particularly useful on the production line where user is not required to edit and debug the program and a PC is not available.

In this mode of transfer "PASSWORD" and "UTILITIES" such as Backlight configuration & Extension module state will also get transferred with the program ladder.



Devie to Card

1. Insert the Memory card in the connector of Altech Smart Relay.
2. Select the "TRANSFER" function from the "PROGRAM" menu.
3. Press the OK key to validate.
4. Select the Device > Card function.
5. Press the OK key to validate.

Card to Device

This transfer is used to reload an application into the Altech Smart Relay. It avoids the need to re-enter an existing application.

1. Insert the Memory card in the connector after removing the serial cable, if present.
2. Move cursor to the "TRANSFER" function from the "PROGRAM" menu.
3. Press the OK key to validate.
4. Select the Card > Device function.
5. Press the OK key to validate.

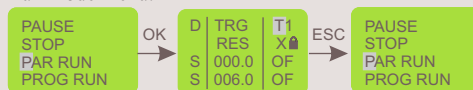
Editing Parameters of Special Function Blocks

Parameters of special Function Blocks can be modified in two modes

1. Run Mode
2. Program Stop Mode

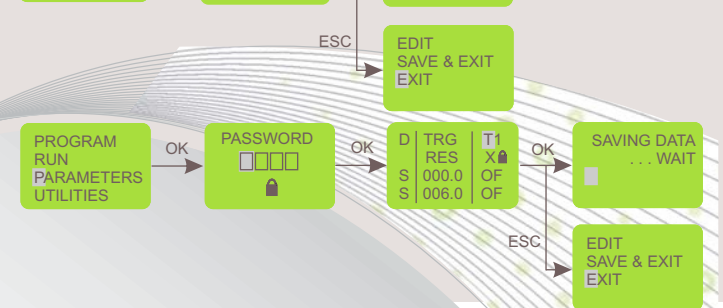
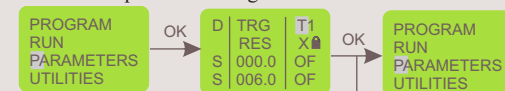
Run Mode

1. User can enter into Run Time parameters. Press ESC to go on the PARAMETER RUN menu as shown below.
2. Press 'OK'. Enter the PASSWORD if it has been enabled and Press OK. Special function block with its parameters set will get display.
3. Set parameters & press OK to save the parameters temporary.
4. Press ESC to return Run Mode Menu.
5. If user do not press OK and do press ESC previous settings retains & returns to Run Mode Menu.



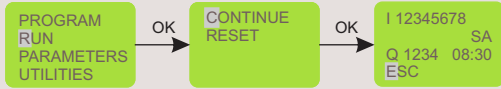
Program Stop Mode

1. Place the cursor on PARAMETERS menu and Press OK.
2. Enter the PASSWORD if it has been enabled and press OK.
3. Set Parameters. Press OK. If user do press ESC key without pressing OK the screen as shown will appear, so that user can have three options as:
 - EDIT: Again enter into parameter set mode.
 - SAVE AND EXIT: Save the parameters & come out of mode.
 - EXIT: Retain previous settings & come out of set mode.



RUN MODE

To enter into RUN mode select the "Run" option in the main menu and press 'OK'.

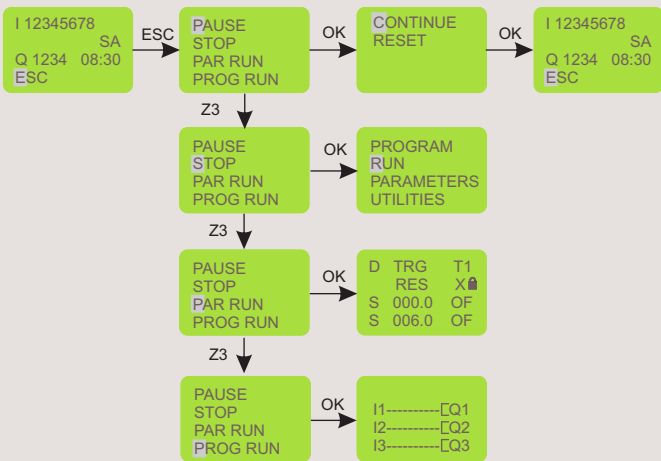


If the CONTINUE option is selected then Ladder Program execution will proceed & the Run mode display screen will appear as shown

If the RESET option is selected then all special function block parameters are initialized & the Run mode display screen will appear

Run Mode Functions

During the Run mode the user can enter the Run Mode Functions by pressing the ESC key



PAUSE

If the PAUSE option is selected by pressing OK then program execution is paused. And user can have two options as

- Continue:** Run with the parameters status it has or
- Reset:** Reset the parameters and run the program.

STOP

If the STOP option is selected by then the program execution is stopped & Main Menu is displayed on the screen.

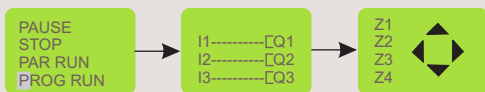
PAR RUN

If the PAR RUN option is selected then Parameter edit window of Special Function Block is displayed. The user can edit the parameters by using ALT, UP, DOWN & OK keys.*

PROG RUN

If the PROG RUN option is selected then the ladder program is displayed on the screen. The user cannot edit the program and can only go through the program by using UP, Down keys

If Z-Keys are used in the program then pressing the ALT key will display the Z-Key screen.



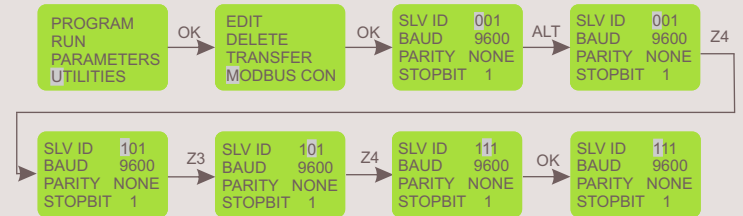
* Embedded parameters when unlocked and edited at run time will not be saved permanently in the device. This functionality is provided only to test the system during run time. To save parameters permanently, user has to stop the program, move to edit mode & configure the system accordingly.

Note: In Run Mode, extension module identities cannot be changed

MODBUS SETTINGS

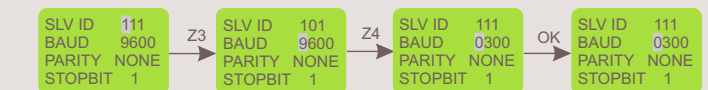
Slave ID

1. Select the "PROGRAM" option from the Main Menu and press OK.
2. Select the "MODBUS CONF" option from the Sub Menu and press OK.
3. The cursor will blink on the first digit of the Slave ID (SLV ID).
4. Press ALT to edit the digit and the digit will now start blinking
5. Using Up(Z4) and Down(Z2) keys select the appropriate digit.
6. Now press Z3 to edit the other digit and using Up & Down keys select the digit.
7. Now press OK to confirm the changes that have been made.



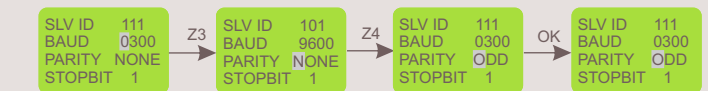
Baud Rate

8. Now press Z3 to select Baud Rate (BAUD) and press ALT to edit..
9. Using Up(Z4) and Down(Z2) keys select the appropriate Baud Rate.
10. Now press OK to confirm the changes that have been made.



Parity

11. Now press Z3 to select 'PARITY' and press ALT to edit..
12. Using Up(Z4) and Down(Z2) keys select the appropriate parity.
13. Now press OK to confirm the changes that have been made.

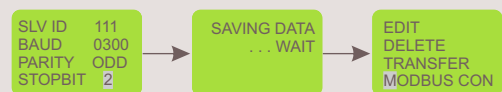


Stop Bits

14. Now press Z3 to select 'STOPBIT' and press ALT to edit..
15. Using Up(Z4) and Down(Z2) keys select the number of stop bits.
16. Now press OK to confirm the changes that have been made.



17. Once all the changes have been made press OK to save and exit.



Parameter Lock

When user edits parameter from text message and if parameter is locked then above screen appears. To change that parameter user has to edit that parameter in edit mode only.

