Programming using the ASR-Soft

ASR-Soft is the exclusive Windows® based programming software for the Altech Smart Relay . It facilitates:

Entering the Program: Select & Place

ASR-Soft provides a user-friendly interface wherein the user has to only select contact type and contact number and place it where it is required. Contacts get connected automatically if they are on the same line. User can enter comments for better readability and for future reference .

Saving Programs

ASR-Soft allows user to save individual programs on the PC.

Debugging

ASR-Soft is very powerful in error handling. It displays any possible errors as the program is being entered to make corrections simultaneously.

Simulation on PC

User can simulate the program on PC. User can use buttons provided on the screen to simulate the input connections. Scroll bar can be used to simulate Analog input. The actuation/ de-actuation of the relays can be monitored on the screen.

Simulation on Altech Smart Relay

User can connect the Altech Smart Relay unit to PC using a serial Communication cable / USB cable and perform on line program simulation. In this mode the PC acts as a master and the inputs are taken from Altech Smart Relay and outputs are sent to Altech Smart Relay unit (and the extension modules, if connected). This mode is useful in debugging the entire system since the actual I/Os are used.
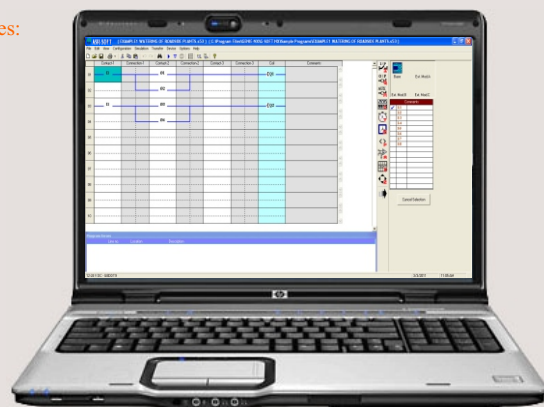
Printing

User can take print outs of programs in two different formats, namely Short format and Detail format. Also, program Parameters and Comments can be printed.

Transfering Programs

Programs can be transferred from PC to Altech Smart Relay and vice versa using serial Communication cable / USB cable. This saves the program entering time on the Smart

Transfering Clock

With this utility user can set the clock (date and time) on the Altech Smart Relay.

Select File -> New from the menu bar to create a new program.
A blank screen will appear. Now you can start entering the program. Ensure that you have chosen proper Altech Smart Relay Configuration before starting the program entry.

Choosing Contact Type

Position the cursor at the place where you want to insert the contact by a left click with mouse. The position will get highlighted. Choose the required contact type and Contact Number from I/O function selector. Click on the required contact and contact number, which will be highlighted for a few seconds. The selected contact will appear at the position selected in the program. The selected contact number will be shown with a tick mark to indicate that it has been used in the program. You can right click on any of the contact to change its type and properties.

Connecting Inputs & Outputs

Each circuit connection runs from left to right. Please remember this when you interconnect contacts and relay coils. User can draw a circuit connection horizontally from left to right and vertically between adjacent circuit connections. An intersection of circuit connections represents an electrical connection.

Horizontal connection

To make a horizontal connection, click on the horizontal dotted line in the connection box of the circuit. Or to make connection in contact box, press right button and select "Joining link". Generally when an output coil is placed in the fourth column, it gets automatically connected.

Vertical connection

To make a vertical connection click on the vertical dotted line in the connection box of the circuit. Vertical connection represents OR connection. For deleting a connection just left click on the connection line.

To Set & Remove Password

- Select the Configuration >Device Utilities menu command. Then Device Utilities window will pop up as shown in the Screen - 1
- Click on set password.
- Enter four digits password in the two boxes "New password" and "Confirm New" Password then confirm with OK.
- You can delete your assigned password at any time. To do this, enter the existing password in "Old password" box. Then confirm with OK.
- To change the password, you must first enter the new password in the two boxes "New password" and "Confirm Password " and the existing password in Current password text box. Then confirm with OK.

To Set Backlight Mode

- Select the Configuration >Device Utilities menu command. Then Device Utilities window will pop up as shown in the Screen - 1.
- Select the mode Auto, On or Off then click on the set mode button.
- Then "The requested operation will move the device out from the run mode. Do you want to continue?" message will pop up.
- If pressed Yes, then backlight mode will get set in device and "Backlight mode has been set successfully" message will appear on the screen.

To Configure Communication Port

- Select the Options > Comm port menu command. Then COM Port setting window will pop up as shown in the Screen - 2 showing two option buttons to select the Port.
- Select "Device is connected to USB port" when the device is connected with cable.
- Select "Device is connected to Serial Communication port" when the device is connected with Serial Communication cable.

To Set Communication Parameters

- Select the Options > Comm port menu command. Then COM Port setting window will pop up as shown Screen - 2.
- The user can set the following communication parameters:
  SLAVE ID: Selectable from 1 to 247.
  BAUD RATE: Selectable as 1200,2400,4800,9600 baud.
  PARITY: Selectable as NONE, EVEN and ODD.
  STOP BIT: Selectable as 1 and 2 stop bits.

Clock Setting

- Select the Transfer > Device Clock menu command. Then Device Clock window will pop up as shown in the Screen - 3.
- To view Date and time of device: Click Read button on the clock setting window. Then the Clock Setting window will show the Date and Time of the device.
- To set Date and time in the device: User can select Date and Time to write into the device. Click Write button on the clock setting window.

DST (Daylight Saving Time) Setting

- Select the Transfer > Device Clock menu command. Then Device Clock window will pop up as shown in the adjoining window.
- To set Enable DST, Follow the following steps: Click Daylight Saving Time check box then the DST setting section becomes visible.
- User can select the following parameters: Begin Week, Begin Day, Begin Month, Begin Time, End Week, End Day, End Month, End Time, Offset Time
- To set Disable DST, Follow the following steps:
  1. Deselect Daylight Saving Time option then DST window will get disable.
  2. Press Set DST.
- To read DST: Press Read DST, independent of the DST enable or disable.
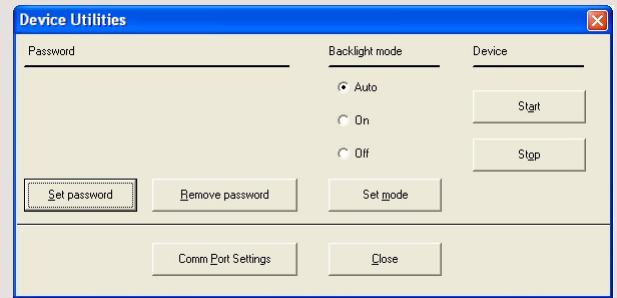
Transfer Options
PC to Device

- Select the Transfer > Program menu command. Then transfer window will pop up as shown in the Screen - 4.
- Press "PC to Device" button on transfer dialog box. Current program on the screen will get transferred to device.
- Transfer completion message "The Program is downloaded successfully" will appear on the screen.
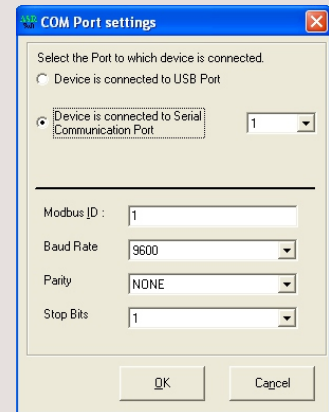
Device to PC

- Select the Transfer > Program menu command. Then transfer window will pop up as shown in the Screen - 4.
- Press "Device to PC" button on transfer dialog box. Current program on the screen will get transferred to device.
- Transfer completion message "The Program is downloaded successfully" will appear on the screen.
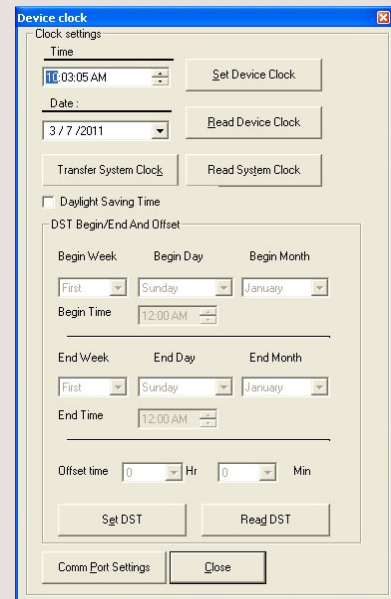- Read program will be shown on main screen.

Extension Module Selection

- Select the Configuration >PLC Model menu command. Then Model Selection window will pop up as shown Screen - 5.
- Selection of Altech Smart Relay model and Extension modules. Maximum three extension modules can be connected to one Base Module.
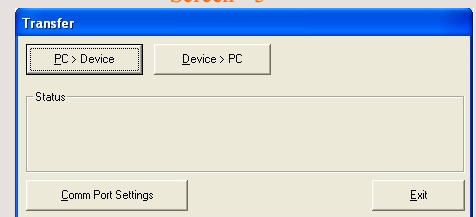
Screen - 1

Screen - 2

Screen - 3
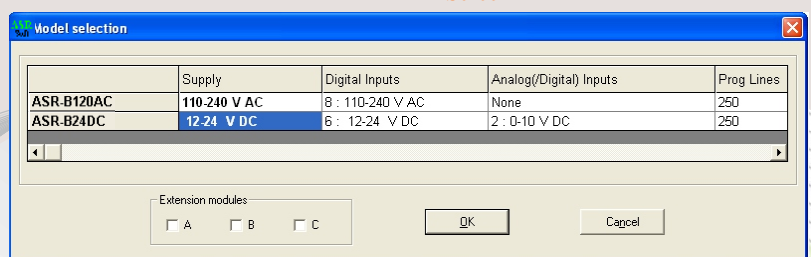
Screen - 4

	Supply	Digital Inputs	Analog(/Digital) Inputs	Prog Lines
ASR-B120AC	110-240 V AC	8 : 110-240 V AC	None	250
ASR-B24DC	12-24 V DC	6 : 12-24 V DC	2 : 0-10 V DC	250

Screen - 5

FACTORY/SCHOOL SCHEDULE

Opening bell at 8am announces start of work or class (bell to last 10 sec and stop): Bell at 10:30am announces start of coffee break, Bell at 10:45am announces end of coffee break, Bell at 12noon announces lunch, Bell at 12:45 announces end of lunch, Bell at 5pm announces end of work day

Programming

For the 6 time periods 6 Time Switches are required. ☉1,☉2, ...☉6 represent the 6 Time Switches.
Timer T1 ensures that the duration of the output is 10 seconds only.
Q1 represents the Output Coil (Alarm/Bell in this case)
Double click on the ASR Soft icon the launch the ASR Soft Software application.
Click on File New to launch a new Program window.

Time Switch Selection & Parameter Editing

1. Click on the Time Switch symbol in the I/O selector window and select Time Switch 1 (☉1)
2. Move the cursor to the 'Contact 1' column of the first row and left click on the block to place the Time Switch.
3. Right click on the Time Switch and select properties to open the properties window.
4. In the Weekday settings option select 'From' as Monday ans 'To' as Saturday.
5. In the Daily Duration option enter the start time as 10:30 and since we want the siren for 10 sec. enter end time as 10:31.
6. Similarly select the other 5 Time Switches and enter the times as described above and place them in the contact 1 column of lines 2, 3, 4, 5 & 6.
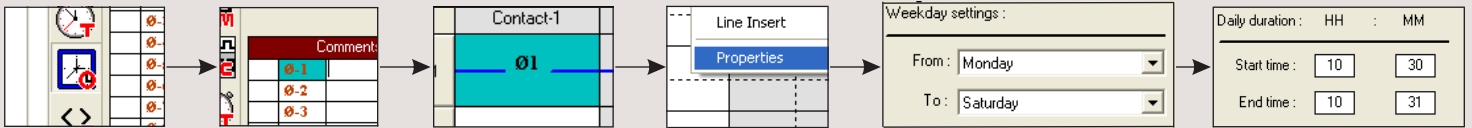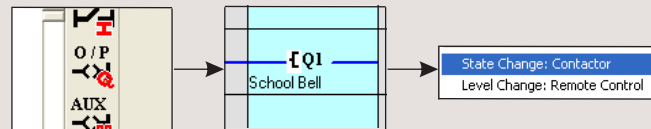

Timer Selection & Parameter Editing

7. Select Timer T1 from the I/O selector window and place it in the coil column of line 1and contact column of line 7.
8. Open the Timer properties window and select the mode as Interval and enter the time duration i.e. SP as 10 sec.
9. Connect the lines from all the Time Switches to the Timer as shown in screen.
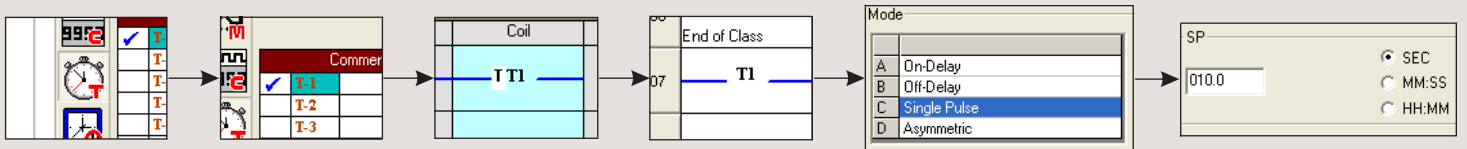
Output Configuration

10. Select Output Q1 from the I/O selector window and place it in the coil column
11. Right click on output Q1 to and select the option 'State Change: Contactor'

LADDER PROGRAM

	Contact-1	Connection-1	Contact-2	Connection-2	Contact-3	Connection-3	Coil
01	Ø1 Start of class						T T1
02	Ø2 Start of Coffee						
03	Ø3 End of Coffee break						
04	Ø4 Start Lunch Break						
05	Ø5 End of Lunch Break						
06	Ø6 End of Class						
07	T1						{Q1 School Bell

CAR PARKING

There are 5 parking spots available in a parking area. There are 2 sensors, one at the entry gate and one at the exit gate. When all the parking spots are occupied, there is a lamp outside the entry gate indicating parking is full. When any of the parking spots is available, other lamp is switched ON indicating parking is available.

Programming

Input I1 is the sensor at the Entry gate and Input 2 is the sensor at the exit gate.
Output Q1 indicates that Parking is available, Output 2 indicates that Parking is Full.
Counter C1 is used to count the number of vehicles that have entered or exited the parking.
Compare Counters P1 & P2 are used switch ON outputs Q1 & Q2 respectively by comparing the count of counter C1.

Input Selection

1. Click on the Input symbol in the I/O selector window and select I1.
2. Move the cursor to the Contact 1 column of the first row and left click on the block to place the input.
3. Again click on the Input symbol in the I/O selector window and select 'I2'.
4. Move the cursor to the Contact 1 column of the second t row and left click on the block to place the input. Also place it in the Contact 1 column of the third row.
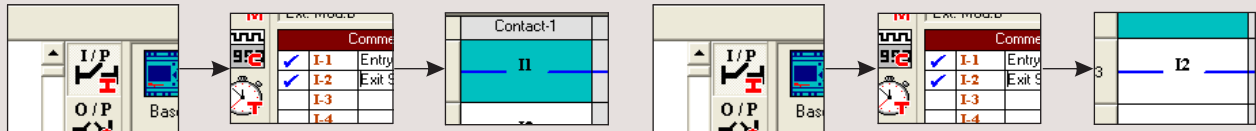

Counter Selection & Parameter Editing

5. Select Counter C1 from the I/O selector window and place it in the coil column of line 1. Right click on the counter and select the option counting input.
6. Again select the same counter C1 and place it in the coil column of line3 . Right click on the counter and select the option direction input.
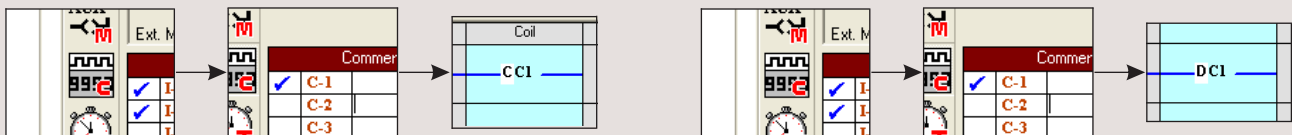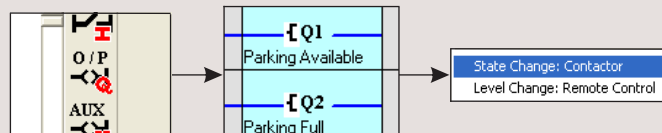

Compare Counter Selection & Parameter Editing

7. Select Compare Counter P1 from the I/O selector window and place it in the contact column of line 4.
8. Right click on the compare counter and select properties.
9. Under the compare selection option, select 'F1' as 'C1', 'OP' as '<', 'F2' as 'Abs Value' and reference count as 5.
10. Select Compare Counter P2 from the I/O selector window and place it in the contact column of line 5.
11. Right click on the compare counter and select properties.
12. Under the compare selection option, select 'F1' as 'C1', 'OP' as '=', 'F2' as 'Abs Value' and reference count as 5.
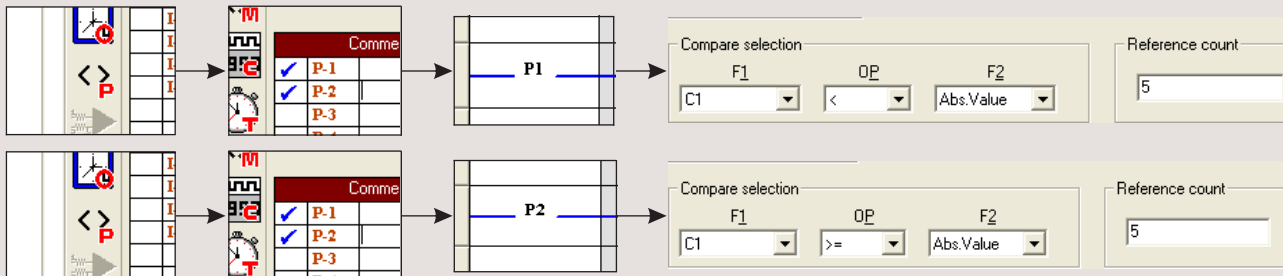
Output Configuration

13. Select Output Q1 from the I/O selector window and place it in the coil column
14. Right click on output Q1 to and select the option 'State Change: Contactor'

LADDER PROGRAM

	Contact-1	Connection-1	Contact-2	Connection-2	Contact-3	Connection-3	Coil
01	I1 Entry Sensor		q2 Parking Full				C C1
02	I2 Exit Sensor						
03	I2 Exit Sensor						D C1
04	P1						[Q1 Parking Available
05	P2						[Q2 Parking Full

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
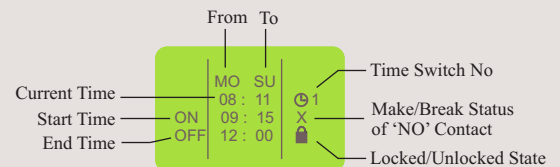xi. Delayed Impulse, xii. Impulse On/Off, xiii. Signal Off/On.

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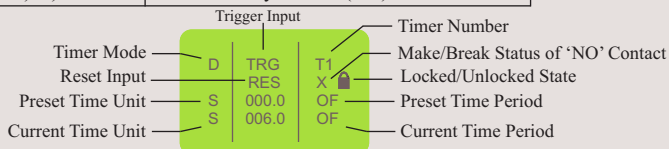
TIME SWITCHES

Altech Smart Relay provides 16 Time Switches which can be used for daily or weekly applications
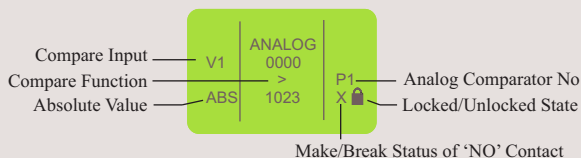
⊙1,⊙2, ... ⊙16	Normally Open (NO) Contact
⊙1,⊙2, ...⊙16	Normally Closed (NC) Contact

ANALOG COMPARATORS

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

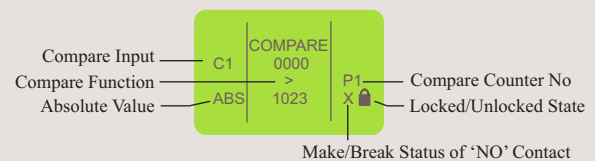| A1, A2, ... A12	Normally Open (NO) Contact
a1, a2, ... a12	Normally Closed (NC) Contact

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
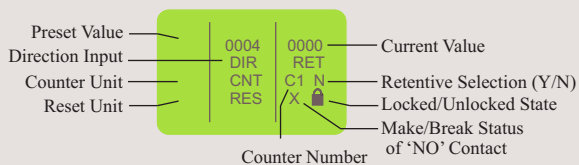I. Up Counter, ii. Down Counter

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