TOSHIBA

Operator Interface Station

OIS60

USER'S MANUAL
Setup and Operation

CONTENTS

For Toshiba T-Series
Programmable Logic Controllers

Toshiba International Corporation

Preliminary

Thank you for purchasing OIS Series product from **Toshiba International Corporation.** OIS Series Products are versatile operator interfaces with Microsoft Windows® based configuration Software.

This manual will help you to *safely* install, configure and operate OIS60 Product.

All the safety warnings and precautions must be followed to ensure proper unit performance and personal safety.

Warnings used in this manual:

DANGER

Danger Warnings are used to indicate situations, locations and conditions that can cause serious injury or death.

CAUTION

Caution Warnings are used to indicate situations and conditions that can cause operator injury and/or unit damage.

We hope that you find this manual informative. If additional information or technical assistance is needed please contact:

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Manual Revisions:
If you contact us in reference to this manual, please include the following document number:
Name: User manual For OIS60
Document: UMAN\OIS60\0603
Rev.: Rev 0

IMPORTANT
OIS Series Products are intended to be operator interfaces, to work with PLCs which actually take control actions. It is assumed that the user is well acquainted with the PLC system being used. Never use OIS units to perform emergency stop applications. It is advised that separate switches be used outside the PLC for ANY emergency stops.

Any mechanical or electrical modification to this unit will
void all warranties.

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1. <u>INTRODUCTION</u>

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➢   **Purpose of this Manual**

➢   **Introduction to OIS60**

➢   **How OIS60 works**

➢   **OIS60 Specifications**

1.1   Purpose of this Manual

The intention of this Operation Manual is to provide a guide for safe installation, configuration and operation of OIS60. This manual is applicable for other OIS series models also.

*Read this operation manual thoroughly before installing and operating OIS60*

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information in this document may not cover all the details or variations in hardware or software. Features described herein may not be present in all hardware. Toshiba reserves the right to update information in this publication without prior notice.

1.2   Introduction to OIS60

OIS Series operator interfaces provide man-machine interface to the PLC system. The OIS communicates with the PLC using on its serial communications port.

Configuration of OIS:

Each OIS has to be configured using the OISetup32 Software before connecting it to the PLC.
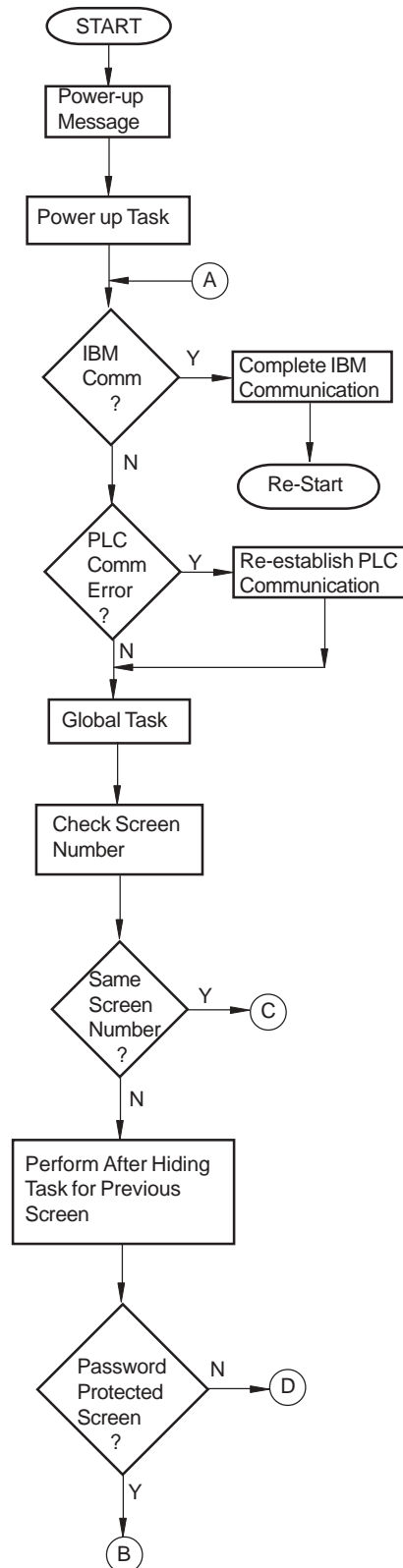

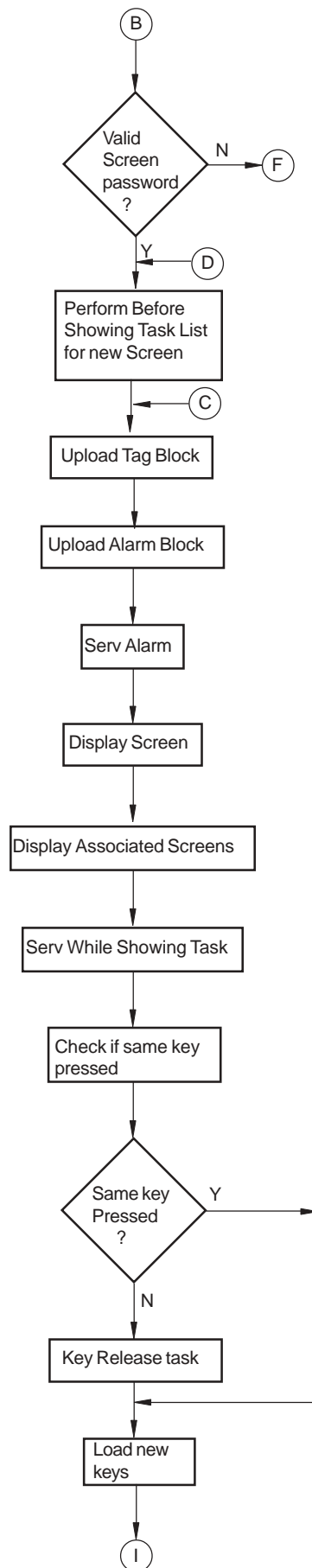OIS-IBM Cable
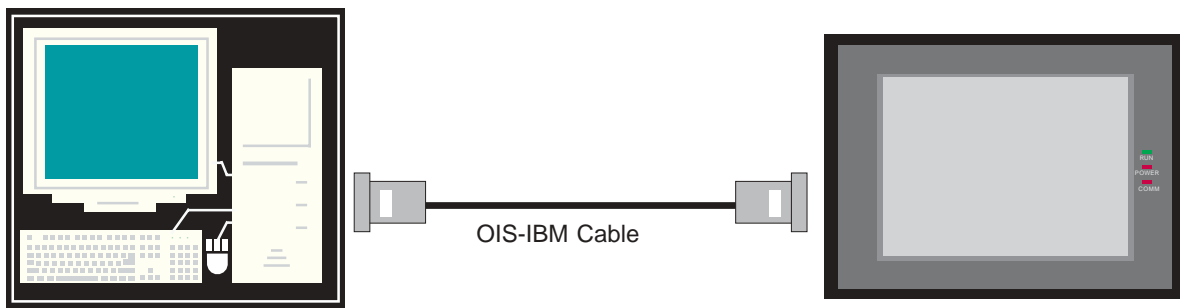
Normal Operation:

Connect OIS to PLC using the correct PLC-OIS cable and your OIS unit is running. OIS can communicate with any RS232 and RS485 device without making any setting on the unit.

PLC

PLC port
of unit

To PLC
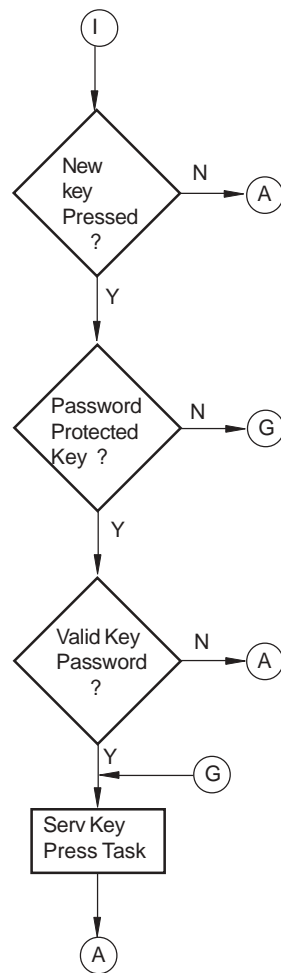Programming Port

PLC

Connecting
Cable
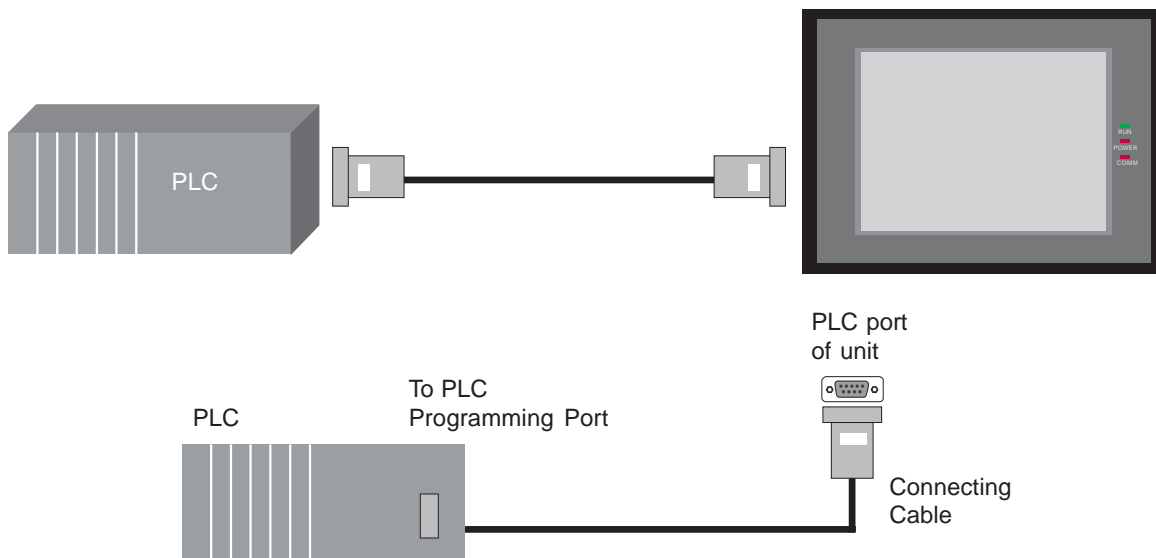
1.3 How OIS60 Works

The OIS60 follows a specific sequence for performing the tasks defined by the user in the application.
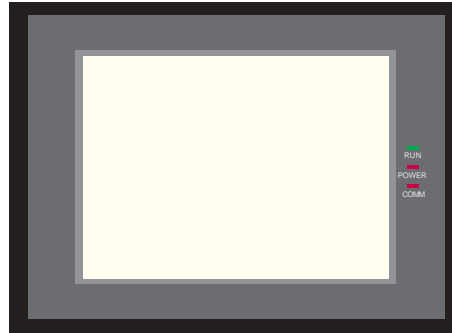The sequence is as shown below

```
                        ┌─────────────┐
                        (   START     )
                        └──────┬──────┘
                               ▼
                        ┌─────────────┐
                        │ Power-up    │
                        │ Message     │
                        └──────┬──────┘
                               ▼
                    ┌──────────────────┐
                    │ Power up Task    │
                    └────────┬─────────┘
                             ◄────────── (A)
                          ╱─────╲
                         ╱ IBM    ╲   Y   ┌──────────────────┐
                        ╱  Comm    ╲─────►│ Complete IBM     │
                        ╲    ?     ╱      │ Communication    │
                         ╲───────╱        └────────┬─────────┘
                           │ N                     ▼
                           ▼                 (  Re-Start  )
                          ╱─────╲
                         ╱ PLC    ╲   Y   ┌──────────────────┐
                        ╱  Comm    ╲─────►│ Re-establish PLC │
                        ╲  Error   ╱      │ Communication    │
                         ╲   ?   ╱        └────────┬─────────┘
                           │ N ◄───────────────────┘
                           ▼
                    ┌──────────────────┐
                    │ Global Task      │
                    └────────┬─────────┘
                             ▼
                    ┌──────────────────┐
                    │ Check Screen     │
                    │ Number           │
                    └────────┬─────────┘
                             ▼
                          ╱─────╲
                         ╱ Same   ╲   Y
                        ╱ Screen   ╲─────► (C)
                        ╲ Number   ╱
                         ╲   ?   ╱
                           │ N
                           ▼
                ┌──────────────────────┐
                │ Perform After Hiding │
                │ Task for Previous    │
                │ Screen               │
                └──────────┬───────────┘
                           ▼
                        ╱─────╲
                       ╱ Password ╲  N
                      ╱ Protected  ╲────► (D)
                      ╲  Screen    ╱
                       ╲    ?    ╱
                         │ Y
                         ▼
                       ( B )
```

(B)

Valid Screen password ? — N → (F)

Y — (D)

Perform Before Showing Task List for new Screen

(C)

Upload Tag Block

Upload Alarm Block

Serv Alarm

Display Screen

Display Associated Screens

Serv While Showing Task

Check if same key pressed

Same key Pressed ? — Y

N

Key Release task

Load new keys

(I)

I

New key Pressed ? — N → A

Y

Password Protected Key ? — N → G

Y

Valid Key Password ? — N → A

Y ← G

Serv Key Press Task

A

1.4 OIS60 Specifications

Power   : *24V DC $\pm$ 10%, 3W maximum*
Display   : *6" diagonal, 320x240 pixel, 256 color, CCFL Backlit (20,000Hrs at 25°C)*
Bezel   : *IP 65 rated Touch Screen*
Operating Temperature : *0°C to 50°C*
Storage Temperature   : *-20°C to 80°C*
Bezel Size   : *139 mm x 197mm*
Panel Cutout   : *183.20 mm x 125.20 mm*
Humidity   : *10% to 90% (Non condensing)*
Communication Ports   : *Two ports, one for connecting to the PLC and one for programming / serial printing.*
Immunity to ESD   : *Level 3 as per IEC1000-4-2*
Immunity to Transients : *Level 3 as per IEC1000-4-4*
Radiated Susceptibility : *Level 3 as per IEC1000-4-3*
Emissions   : *EN55011 CISPR A*

System Components:

- *OIS60 unit with LCD display and Touch Screen.*
- *Power Supply connector.*
- *Installation Kit: Gasket, Six Mounting Clamps.*
- *OISetup32 Software Installer.*

Note: User should order PLC / IBM cable separately.

2. HARDWARE

In this Chapter

- ➢ **Installation Instructions**
- ➢ **Power Requirements**
- ➢ **Serial Port**
- ➢ **PLC Port**

2.1   Installation Instructions

The OIS60 should be mounted on a panel. Gasket, mounting clamps are provided with each OIS60 unit for proper mounting.

Environmental Considerations:

Make sure that the unit is installed correctly and that the operating limits are followed (see Specifications for OIS60).

Do not operate OIS60 in areas subject to explosion hazards due to flammable gases, vapors or dusts.

OIS60 should not be installed where fast temperature variations are present. Highly humid areas are also to be avoided. High humidity causes condensation of water in the unit.

Location Considerations

Care should be taken when locating equipment behind the OIS to ensure that AC power wiring, PLC output modules, contactors, starters, relays and any other source of electrical interference are located away from OIS60.

Particular care should be taken to the position of Variable speed drives and switching power supplies away from the OIS60.

Panel Mounting

This section presents the dimensional sketches and panel cutouts for OIS60 model.
All dimensions are in mm. Not to Scale.

Panel Cutout : 183.20 mm x 125.20 mm
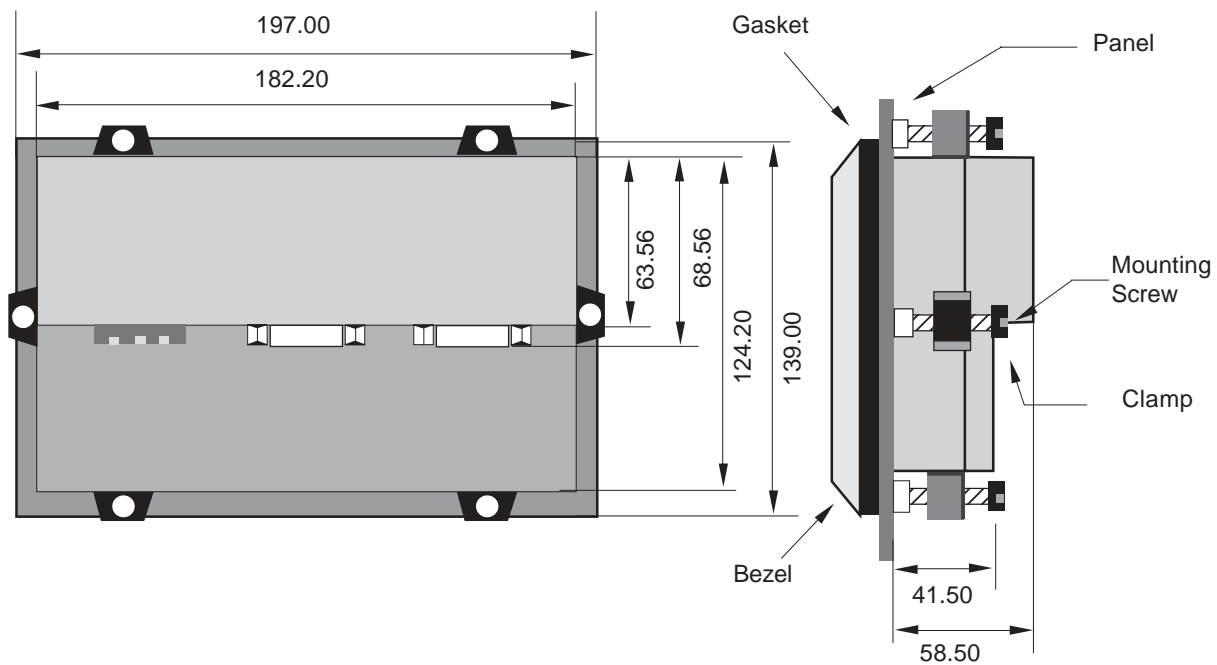
Follow the procedure given below for proper mounting:
    1) Make a cutout of the required size. Panel cutout tolerance is $\pm$ 0.1mm.
    2) Put the gasket behind the bezel (see dimensional sketch for details). The gasket may be
        sealed to the case using an adhesive.
    4) Put the OIS60 unit through the panel cutout.
    5) Insert the clamps into the case.
    6) Pullback the clamps until they seat into the retaining slots.
    7) Tighten the clamping screws in an even pattern until the OIS60 unit is secured into the panel.

2.2   Power Requirements

Supply voltage for OIS60 models is +24VDC $\pm$ 10%, 3W maximum.

Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods (Article 501-4 (b) of the National Electrical Code, NEPA 70) and in accordance with the authority having jurisdiction.

⚠   ***A.   "THIS EQUIPMENT IS SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D OR NONHAZARDOUS LOCATIONS ONLY."***

⚠   ***B.   "WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2."***

⚠   ***C.   "WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NONHAZARDOUS."***

Please follow the instructions given below while making power supply connections for models:

Follow the wiring diagram on the sticker of the unit which shows terminals for the positive DC, negative DC and Earth.

To make a connection strip about 1/4" of insulation of the wire, turn the connector screw counter-clock wise until the gap is wide open. Insert the wire all the way in and turn the screw clockwise until it is tight.

Wire lengths should be minimum. Wires should run in pairs with a neutral or common paired with a live or signal wire.

OIS model is fused internally with a self resetting 60V, 400mA fuse. It is recommended that all input power lines be protected from product failure by a fuse or breaker.

Adequate strain relief must be provided for the power connector, to ensure that vibration does not cause the power connector to pull out.

All the OIS products are housed in a moulded ABS plastic case which eliminates any electrical shock hazard. Hence Safety Earth is not required to be connected to the chassis of the unit.

The DC ground is not directly coupled to Earth ground internally. The unit is designed to operate properly whether or not the DC ground is connected to the Earth ground. We do recommend, however, that if the DC ground has to be connected to the Earth ground, the Earth connection should be made to a central star point as poor site earths can introduce noise into a system.

Do not power unit and inductive loads with the same power supply even though there is enough immunity in the OIS to withstand the transients present on these lines. Avoid using power supplies with large capacitive outputs which may cause problems if power is cycled within a short time period.

If wiring is to be exposed to lightening or surges, use appropriate surge suppression devices.

Keep AC, high energy and rapidly switching DC wiring separate from signal wires.

Connecting high voltages or AC power mains to the DC input will make unit unusable and may create an electrical shock hazard to personnel. Such a failure or shock could result in serious personal injury, loss of life and/or equipment damage. DC voltage sources should provide proper isolation from main AC power and similar hazards.

Wiring diagram for OIS60:

Pin description of the power connector for OIS60 is as follows:
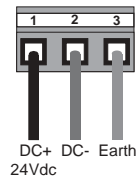
2.3 Serial Port

OIS60 units have two communication ports - Multi-Signal PLC Port and RS232 Serial Port. Description of each is given in the following topics.

Serial port is used to download the firmware and application in the OIS unit. OIS also has serial printout capabilities. This port can be attached to a computer / serial printer using the proper cable. This port is always active. When OIS is communicating with a PC for programming, PLC operations are suspended. Pin description of the Serial Port as seen on the OIS60 unit is given below:

DB9 Female
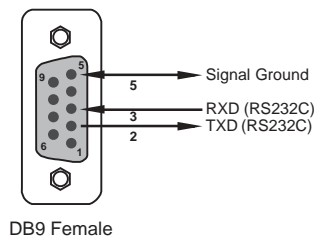
2.4 PLC Port

The cable connecting PLC to OIS is attached to PLC Port. Different cables are required for different PLCs /controllers. Cable details for any particular PLC are given in the Operation Manual for that PLC. Pin description of the PLC Port for OIS60 model is as given below:

DB9 Female
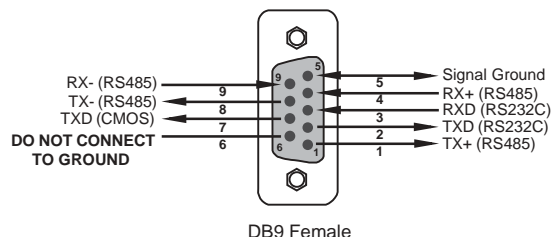
Refer to Appendix A for cable connection diagrams.

3. GETTING STARTED

In this Chapter

> **Introduction**
> **Application - Tags, Screens, Keys and Tasks**
> **PLC Communications**

3.1 Introduction

OIS60 is an Operator Interface for PLCs. It communicates with a PLC over its serial communication port to get the information required by the operator. Information could be the value of a PLC register or the status of a PLC coil. This information is displayed on the LCD display of unit. If required, OIS60 can also change the values of PLC registers / coils.

3.2 Application - Tags, Screens, Touch Screen keys and Tasks

Microsoft Windows® based configuration software, OISetup32, configures the OIS60. 'Configuration' means making the OIS60 unit work as per the system requirements, example. OIS60 can be configured to be used with any PLC, display any register data, perform any action using a key. The complete configuration for a unit is termed as 'Application'. Application comprises of Tag Data base, Screens, Key Definitions, Alarms and Tasks.

Each register in the PLC memory has a unique address and can be identified by giving a specific name to it. This information is stored as Tag Data Base in OISetup32. Any coil or register to be used in the application is known as a Tag and must be first defined in the Tag data base.

The LCD display on OIS60 unit displays the PLC data on a 'Screen'. PLC data can be arranged on a screen using different objects.

Operator can control the process by actually changing the value of PLC registers. This is possible with the help of the Touch Screen keys. Different tasks can be assigned to keys on the OIS60 keypad.

Any register can be constantly monitored if alarms are defined for it. When alarm condition is reached, the respective alarm is displayed on the screen.

Once the application is defined, firmware for the specific unit and PLC is downloaded and then application is downloaded into the unit. OIS60 can now communicate with a PLC.

3.3 PLC Communications

OIS60 can communicate with any PLC without any change in the OIS60 hardware. To communicate with a PLC, OIS60 unit needs:
> 1. Proper Communication Driver for the PLC
> 2. OIS60 - PLC communication cable

1. Communication Driver for the PLC:
Each PLC has a defined protocol for communicating with any device. Communication Driver is down loaded in to OIS60 unit along with the **firmware**. Communication driver varies from PLC to PLC. This driver enables unit to talk to a specific PLC, such as a Toshiba T1 PLC.

2. OIS60 - PLC Communication Cable: Proper OIS60 - PLC cable is required for error free communication with any PLC.

4. UNDERSTANDING OIS FEATURES

In this Chapter

> **Screens and Touch-Screen Keys**
> **Alarms**
> **Application Task-List**

Understanding OIS Features

This chapter explains in detail all the features of OIS60 unit. We recommend that you study this chapter before attempting to configure and use the OIS60.

4.1   Screens

Operator can view required information on the display of OIS60 unit. This information can be arranged in such a way that the operator can very easily interpret the information received. This can be done by using various tools. These tools are the objects. Each screen can have various types of objects with different properties. Each screen can have five properties, which are applicable for the complete screen.

Properties of Screens:
4.1.1. Password:
Access levels can be achieved by introducing a password for a screen. Password value can vary between 0 - 9999. Unless user enters the correct password, the screen will not be displayed. Any screen can be password protected.

4.1.2. Associated Screens:
Associated screen can be especially useful in cases where one or more objects are common between different screens. The common part is extracted from all the screens, placed in a new screen and this new screen is associated with the other screens. Any screen can be associated to another screen.
Advantages of associated screens:
  1. Saves application memory by extracting common part between different screens and forming a new associated screen.
  2. Saves time of the application programmer.
Please note:
  - Only one screen can be associated to any screen.
  - No data entry object can be placed in the screen to be associated.
  - No PLC tag embedding in the screen to be associated. To embed a PLC tag, In Global Task-List the required PLC tag should be copied to an internal tag. The internal tag should be embedded in the screen to be associated.

4.1.3. Screen Task-List
Tasks are operations performed by unit when a certain condition is reached. Different tasks can be defined for different screens. Screen Tasks can be assigned for three different conditions:
  - Before showing: These tasks are performed before displaying a particular screen on the display.
  - While showing: Tasks are repeatedly performed while the screen is displayed.
  - After Hiding: Tasks are performed after another screen is called and before displaying a new screen.

Example: Suppose Screen 1 is currently on the display simultaneously performing 'while showing' task. Now PLC Tag calls for Screen 2. Both the screens have all three types of tasks: Before showing task, While showing task, After hiding task. Tasks will be performed in following sequence:
  1.   After hiding task for screen 1 performed while clearing screen no. 1.
  2.   Before showing task for screen 2 performed.
  3.   Screen 2 displayed.
  4.   While showing task list performed repeatedly.
  5.   When another screen is called 'after hiding task' is performed while clearing screen 2.

Types of Screen-Tasks:
  1.   Goto Screen
  2.   Goto Next Screen
  3.   Goto Previous Screen
  4.   Write Value to a Tag
  5.   Add a Constant Value to Tag
  6.   Subtract a Constant Value from Tag
  7.   Add Tag B to Tag A

8.   Subtract Tag B from Tag A
9.   Turn Bit On
10.   Turn Bit Off
11.   Toggle Bit
12.   Copy Tag B to Tag A
13.   Swap Tag A and Tag B
14.   Print Data
15.   Copy Tag to STR (Screen Triggering Register)
16.   Copy Tag to LED
17.   Delay
18.   Wait
19.   Copy Recipe block to PLC block
20.   Copy PLC block to Recipe block

Description of Screen Tasks:

1. Goto Screen:
Current Screen is replaced by the defined screen. This command does not work when a PLC register is used as STR. More information given in Application Task-List Section.

2. Goto Next Screen:
This task is useful when two screens are in succession. Screen is changed to display the next screen. If two screens are not successive, there is a gap between two screens then 'Screen not defined' message will be displayed. This message will stay on the screen till a valid screen is called. This task does not work when a PLC tag is used as a STR.

3. Goto Previous Screen:
This task is useful when two screens are in succession. Screen is changed to display the previous screen. If two screens are not successive, there is a gap between two screens then 'Screen not defined' message will be displayed. This message will stay on the screen till a valid screen is called. Again this task does not work when a PLC tag is used as a STR.

4. Write Value to a Tag:
A constant value can be downloaded to a tag using this task, provided the tag is not a read-only tag.

5. Add a Constant Value to Tag:
A constant can be added to the current value of a tag using this task.

6. Subtract a Constant Value from Tag:
This task is used to subtract a constant value from the current value of a tag.

7. Add Tag B to Tag A:*
Tag B can be added to tag A using this task. The result will be stored in tag A.

8. Subtract Tag B from Tag A:*
Tag B is subtracted from tag A using this task. The result will be stored in tag A.

9. Turn Bit On:
Any coil or bit can be turned on using this task. The bit/coil should be a read-write coil.

10. Turn Bit Off:
Any coil or bit can be turned off using this task. The bit/coil should be a read-write coil.

11. Toggle Bit:
Any coil or bit can be toggled using this task. The bit/coil should be a read-write coil.

12. Copy Tag B to Tag A:*
Tag B can be copied to tag A using this task. The value of tag B will be unchanged. Tag A will be same as tag B.

13. Swap Tag A and Tag B:*
Values of two tags can be swapped using this task. Tag A value will be copied to tag B and tag B value will be copied to tag A.

14. Print Data:
All the text data will be printed on the serial port. Communication settings will be same as defined in 'OIS Settings' 'Printer Port Options' window. Graphical objects will not be printed.

15. Copy Tag to STR:
This is a very important task which allows user to trigger screens dependent upon any PLC tag. Screen Triggering Register is a system register inside OIS60 which decides the screen to be displayed. PLC tag can be copied to STR.

16. Copy Tag to LED:
LED's on the keypad of OIS60 can be turned on/off depending on the value of a tag. The tag should be copied to LED register and the LEDs will display the tag value.

17. Delay:
Any task can be delayed using this task. Tags will be updated during this delay.   After the delay is completed the next task will be performed.

18. Wait:
This is a conditional delay. Next task will not be performed till the specified condition is false.

19. Copy Recipe block to PLC block:
Recipe block will be copied to PLC block using this task. The block size will be set by the user.

20. Copy PLC block to Recipe block:
PLC block will be copied to Recipe block using this task. The block size will be set by the user.

* While defining double Tag operations, make sure both the tags have same number of bytes. Else the task may lead to erroneous / unexpected results

4.1.4. Screen Types
Screen information can be printed on a serial printer. Depending on it's printing properties, screens can be of three types:
- Print-only
  The screen will be printed as soon as it is triggered. The screen will not be displayed
  Maximum number of characters printed will be set from Prizm Settings menu.
- Display
  The screen will be displayed on the display.
- Both
  The screen can be printed as well as displayed. The screen will be printed as soon as it is triggered.

4.1.5. Screen Background Color
Each screen can have a different background color. User can select from the color pallet given for color selection.

4.1.6. Screen Saver:
User can enable screen-saver for each screen. Screen saver delay can be defined from the application. Display will be turned off after the specified time delay.

4.1.7. Touch-Screen Task List:
OIS60 has a Touch-Screen for performing various tasks. Touch-Screen Tasks are same as the Screen tasks. Tasks can be performed in three different instances: Touch key Press, Touch Key Pressed and Touch Key Released Tasks. Please refer to Screen Task List details. Same touch key can have three tasks to be performed for three instances.

Other than the Screen Task-list, Touch-Screen Task List has two additional Tasks supported:
1. Key's Specific Task.
   This task enables user to define task which are specific for keys. This task is specially useful for editing data in the system or checking / acknowledging alarms. Following is the list of key's specific tasks:
   1. Clear Data Entry: Clears Data after data entry is initiated.
   2. Cancel Data Entry: Cancels the data entered and restores previous data.
   3. Accept Data Entry: Initiates data entry and accepts data entered.
   4. Switch to next Data Entry: Next data entry is selected.
   5. Increase Value by 1: Value of a tag is increased by 1.
   6. Decrease Value by 1: Value of a tag is decreased by 1.
   7. Increase Digit by 1: Value of a single digit of a tag is increased by 1.
   8. Decrease Digit by 1: Value of a single digit of a tag is decreased by 1.
   9. Shift Value to Left: Value is shifted to left.
   10. Move Cursor to Left: Cursor is moved to left to edit next digit.
   11. Move Cursor to Right: Cursor is moved to right to edit next digit.
   12. Sign Key (+/-): Used for signed data entry.
   13. Sign Key (+/-) and 0: Single key used as a sign key as well as numeric key 0. If this key is pressed immediately after data entry is initiated, key is taken as sign key else it is taken as '0' key.
   14. Numeric Key 0 - 9: Enters the numeric after data entry is initiated.
   15. Edit Bit On: A coil is turned on after data entry is initiated.
   16. Edit Bit Off: A coil is turned off after data entry is initiated.
   17. Acknowledge Alarm: Active alarm is acknowledged using this key.
   18. Next Alarm: Next alarm from the container is displayed.
   19. Previous Alarm: Previous alarm from the container is displayed.

2. Set RTC:
   User can edit RTC registers of the OIS unit. This task increments selected RTC register at a time for one instance. User can edit Year / Month / Date / Hour / Minutes / Seconds / Day of the week. User must place a Time / Date object on the screen for editing the RTC.

Screen Objects:

For the OIS60, screen objects are text as well as graphic objects. Types of Objects supported are:
General Objects:

1. Plain Text	2. Coil Data Entry
3. Register Data Entry	4. Display Coil Status
5. Display Register Data	6. Display Register Text
7. Time	8. Date
9. Alarms	10. Rectangle
11. Ellipse	12. Rounded Rectangle
13. Line	

Wizards:

14. Bit Button	15. Word Button
16. Bit Lamp	17. Word Lamp
18. Single Bar Graph	19. Multiple Bar Graph
20. Analog Meter	21. Numeric Keypad
22. Bitmaps	

Understanding OIS Features

1.   Plain Text:
       Plain text object is useful for displaying any message for the operator. Plain Text Objects do not
       depend on the PLC Tag. Even if the PLC is not connected, this object will be displayed.

2.   Coil Data Entry:
       Data Entry can not be performed unless user places a Numeric Keypad object on the screen.
       Numeric Keypad object assigns tasks for the Touch Keys in the specified area. Procedure to edit
       a coil is as follows:
       1. Press ENT key to initiate data entry mode. Data entry mode is indicated by flashing the
          complete data entry object.
       2. Use keys with definition 'Increase Digit by 1' or Numeric keys '0' and '1' to edit data.
       3. Press 'ENT' key to accept the data entered.

3. Register Data Entry:
       Data Entry can not be performed unless user places a Numeric Keypad object on the screen.
       Numeric Keypad object assigns tasks for the Touch Keys in the specified area. Procedure to a
       edit register is as follows:

       1. Press key with definition 'Accept Data Entry' to initiate data entry mode. Data entry mode
          is indicated by flashing the last digit of the register. Key with definition 'Clear Data Entry'
          clears the data. Key with definition 'Cancel Data Entry' cancels the data entered and exits
          data entry mode.

       2. In OIS60 keypad, press key with definition 'Sign (+/-) and 0' to enter negative sign. Sign
          will be automatically adjusted for the other models. For models without numeric keypad,
          use keys with definition 'Increase Digit by 1' and 'Shift Value to Left' else use Numeric
          keys '0' through '9' to edit register data.

       3. Press key with definition 'Accept Data Entry' to accept the data entered. When a new
          application is created each key is assigned a default definition by the software. *Please
          note that the unit must have above mentioned key definitions to edit any register tag.*
          When a new application is created each key is assigned a default definition by the soft
          ware. In OIS60 default keys for register data entry are "ENT", "ESC" and the numeric keys
          from "0" through "9".

4.   Display Coil Status:
       This object displays text defined in the application depending on the bit status. Bit on and Bit off
       text is defined by the user while writing the application.

5.   Display Register Data:
       This object displays the value of a register. The format of the display can be selected from the
       application.

6.   Display Register Text:
       This object displays text string depending value of a register. Text for various ranges of the
       register is defined by the user while creating the application.

7.   Time:
       This object displays time in HH:MM:SS format. Time is displayed in 24 hour format without
       leading zeros.

8.   Date:
       This object displays date in DD/MM/YY format without leading zeros.

9.   Alarms:
       This object displays the alarm text when the alarm occurs. Alarm condition and text is defined

from the Define Alarm window. First triggered alarm is on top. Alarm condition for alarm should be cleared. Each alarm has to be acknowledged. Touch key with definition 'Acknowledge Alarm' acknowledges the alarm. An Alarm is cleared from the screen when the alarm condition is cleared and the alarm is acknowledged. Alarm object shows '???' when no alarms are present.

10. Rectangle:
    User can draw a rectangle of required size and required color using this object. User can also fill the rectangle with required color.

11. Ellipse
    User can draw a ellipse of required size and required color using this object. User can also fill the ellipse with required color.

12. Round Rectangle:
    User can draw a rectangle with rounded corners of required size and required color using this object. User can also fill the round rectangle with required color.

13. Line:
    User can draw a line of required size and required color using this object.

14. Bit Button:
    Bit button object enables user to perform a task. User can assign any task to this Touch Key. The display of the object can change depending on the status of a coil. This selection should be made in the application. This object is like a redefinable key without any conditions.

15. Word Button:
    User can define various tasks for the same Touch key. Different tasks are defined for different states of a word tag. User can also change the display of the button depending on the state of the tag. Tasks of each state can further be defined for three instances-press, pressed and released.

16. Bit Lamp:
    Status of coils can be displayed more effectively by using this object. Various shapes can be selected from application for two states of a coil.

17. Word Lamp:
    This object is same as a Bit Lamp except the associated tag is a word type tag. Different states / values of a tag can be represented by different shapes.

18. Single Bar Graph:
    User can draw a bargraph of a word tag by using this object. User should define maximum and minimum limits, direction and fill color.

19. Multiple Bar Graph:
    User can plot four different variables using this single object. Object displays the bargraphs in different colors, range text, border.

20. Analog Meter:
    Any word tag can be plotted on a meter with variable limits. This object gives a better presentation of the value

21. Numeric Keypad:
    Numeric keypad is useful for editing PLC data. User must have a coil or register data entry object on the screen to use this object. If data entry object is not placed on the screen, then this object can not be used.

22.   Bitmaps:
        Stationary bitmaps can be placed on the screen. 256 color Bitmaps can be added to the screen.

4.2   Alarms

Any tag can be continuously monitored by defining alarms for each bit of that tag. To display an alarm on the screen as soon as it is triggered, alarm object has to be placed on the screen. An alarm is triggered for each bit in a tag. If the value of the particular tag becomes nonzero, corresponding alarm is displayed in the alarm object. 16 alarms can be defined in Alpha-Numeric OIS model. OIS stores the alarm information in an alarm container. Triggered alarms are stored in a container. First triggered alarm is on the top of the container. New alarm is added from the bottom of the container. Operator has to acknowledge each alarm by using any key with definition 'Acknowledge Alarm'. When alarm condition is cleared **and** the alarm is acknowledged, the alarm is deleted from the container. Alarm can also be printed on the serial port. Printing is performed as soon as the alarm is triggered.

Consecutive Alarms: This type of alarms are useful when user has to monitor a sequence of tags.

Discrete Alarms: Discrete alarms can be useful when user wants to monitor tags which are not in a sequence, i.e. tag is discrete.

An alarm is defined for each bit of tag. When any bit of any tags is found to be on ('1') corresponding alarm is triggered. Triggered alarm is displayed in the alarm object. User should define a key to acknowledge alarms. User can also scroll through the table of alarms using keys defined as 'Next Alarm' and 'Previous Alarm'. Acknowledged and Inactive alarm is deleted from the container. New alarm is added to the bottom of the container. The alarm container has the capacity to store 64 alarms. Total 256 alarms can be defined.

To display alarm user must follow steps given below:
    1.   Define consecutive or discrete alarms from 'Define Alarm' window. Definition contains the alarm text and print selection.
    2.   In Screen Definition, place Alarm object on the appropriate location on the appropriate screen.
    3.   Edit the alarms window to select alarm fields and their length.

Alarm will be displayed IF the screen containing an alarm object is displayed. If the current screen does not have an alarm object, alarms WILL NOT be displayed.

4.3   Application Task-List

Application task-list allows user to define tasks to be performed after unit is powered on while application is running. Application task-lists are of two types:

1.   Power-on tasks:
Power-on tasks are performed after OIS60 unit is powered on. These tasks are like a boot sequence for OIS60 which are performed only once. Using these tasks user can initialize some registers, Goto a particular screen after power up etc. Please note that user MUST define 'Goto Screen' Task in power-On task list.

2.   Global tasks:
Global tasks are performed regularly till the application is in progress. These tasks are useful when the user wants to perform some tasks repeatedly. In case the PLC is not connected then PLC related tasks will not be performed.

Types of Application Tasks:
                1.   Goto Screen
                2.   Goto Next Screen

3. Goto Previous Screen
4. Write Value to a Tag
5. Add a Constant Value to Tag
6. Subtract a Constant Value from Tag
7. Add Tag B to Tag A
8. Subtract Tag B from Tag A
9. Turn Bit On
10. Turn Bit Off
11. Toggle Bit
12. Copy Tag B to Tag A
13. Swap Tag A and Tag B
14. Print Data
15. Copy Tag to STR (Screen Triggering Register)
16. Copy Tag to LED
17. Delay
18. Wait
19. Copy Recipe block to PLC block
20. Copy PLC block to Recipe block

Description of Application Tasks:

1. Goto Screen:
Current Screen is replaced by the defined screen. This command does not work when a PLC register is used as STR. More information given in Application Task-List Section.

2. Goto Next Screen:
This task is useful when two screens are in succession. Screen is changed to display the next screen. If two screens are not successive, there is a gap between two screens then 'Screen not defined' message will be displayed. This message will stay on the screen till a valid screen is called. This task does not work when a PLC tag is used as a STR.

3. Goto Previous Screen:
This task is useful when two screens are in succession. Screen is changed to display the previous screen. If two screens are not successive, there is a gap between two screens then 'Screen not defined' message will be displayed. This message will stay on the screen till a valid screen is called. Again this task does not work when a PLC tag is used as a STR.

4. Write Value to a Tag:
A constant value can be downloaded to a tag using this task, provided the tag is not a read-only tag.

5. Add a Constant Value to Tag:
A constant can be added to the current value of a tag using this task.

6. Subtract a Constant Value from Tag:
This task is used to subtract a constant value from the current value of a tag.

7. Add Tag B to Tag A:*
Tag B can be added to tag A using this task. The result will be stored in tag A.

8. Subtract Tag B from Tag A:*
Tag B is subtracted from tag A using this task. The result will be stored in tag A.

9. Turn Bit On:
Any coil or bit can be turned on using this task. The bit/coil should be a read-write coil.

10. Turn Bit Off:
Any coil or bit can be turned off using this task. The bit/coil should be a read-write coil.

11. Toggle Bit:
Any coil or bit can be toggled using this task. The bit/coil should be a read-write coil.

12. Copy Tag B to Tag A:*
Tag B can be copied to tag A using this task. The value of tag B will be unchanged. Tag A will be same as tag B.

13. Swap Tag B to Tag A:*
Tag A and Tag B values can be swapped using this task.

14. Print Data:
Text data on the particular screen will be printed.

15. Copy Tag to STR:
Any specified task will be copied to STR. This STR decides the screen to be displayed.

16. Copy Tag to LED:
LEDs of the Prizm can be used to reflect the value of a tag. The tag should be copied to LED register for such functionality.

17. Delay:
An unconditional delay can be added to the task list. All the tasks after this task are delayed by the specified time.

18. Wait:
All the tasks after this task are not performed till the condition specified by this task does not become true.

19. Copy Recipe block to PLC block:
Recipe block will be copied to PLC block using this task. The block size will be set by the user.

20. Copy PLC block to Recipe block:
PLC block will be copied to Recipe block using this task. The block size will be set by the user.

* While defining double Tag operations, make sure both the tags have same number of bytes. Else the task may lead to erroneous results.

5. CONFIGURATION SOFTWARE

In this Chapter

- ➢   **Introduction to OISetup32 Software**
- ➢   **Installing OISetup32 Software**
- ➢   **OISetup32 Software - Basics**
- ➢   **Create a New Application**
- ➢   **Save and Download Application**

5.1   Introduction to Configuration Software - OISetup32

OISetup32 is Microsoft Windows® based software to configure the OIS60 by Toshiba International Corp. OISetup32's tools and easy approach can help you create your applications quickly and easily.   By using some of OISetup32's new features, you can be more effective in what you need. Whether you need a small application to monitor data or a bigger application for both monitoring and changing data in your PLC, OISetup32 has it all.

With OISetup32 you can get started quickly to use your OIS60 unit. Developing your applications for OIS60 unit from Toshiba International Corp. is easy using OISetup32. The common functionality found among many Windows applications can also be found here and will allow you to quickly adapt to OISetup32. Once you are familiar with the many visual clues in OISetup32, creating an application will be a breeze. The idea behind designing OISetup32 and the OIS60 is to allow you to get where you want to... FAST!

You can use OISetup32 to configure OIS60 model to work with ANY of the drivers supported. OISetup32 currently supports over 25 PLCs and ASDs (Adjustable Speed Drives)..

As noted earlier, the user must first configure OIS60 unit for operating with a specific PLC.   The OIS60 communicates with a PLC only after downloading the correct driver and application into the unit. The OIS user should follow the procedure to configure and use the OIS:
1.   Create an application for required PLC.
2.   Apply 24VDC power to OIS60.
3.   Connect IBM cable to the communication port of OIS60 marked as 'Serial Port'
4.   Download Firmware i.e. driver for the PLC. The OIS60 unit cannot communicate with PLC till the required driver is downloaded.
5.   Download application.
6.   Now connect to the PLC with the PLC cable.

5.2   Installing OISetup32 Software

The current version of the OISetup32 software is available from the Toshiba Houston website, www.tic.toshiba.com.   Go to the PLC Section, Files available to download.

System requirements for installing OISetup32 on your PC:
Windows Version	:	Microsoft Windows 95 or higher
Processor	:	PENTIUM or higher
Hard disk Space	:	5 MB or more
Serial Mouse	:	Required
RAM	:	16 MB or more
Display resolution	:	640 x 480 (VGA) or better
Display colors	:	16 colors or more

To install OISetup32 software:

1.   Open Microsoft Windows. 'Start' program task button is located at the bottom left portion of your screen.
2.   Place the installation disk into your computer's floppy drive (usually either drive A or drive B).
3.   Select Run, and a pop-up window appears. Type the path and file name for installing setup (A:\SETUP.EXE or B:\SETUP.EXE). Press OK. Now setup will install OIS software in the directory specified by the user. Please insert subsequent floppies when the Setup asks.

5.3   OISetup32 Software Basic

The OIS60 unit has to be configured before its use in any system. Complete configuration consists of defining:
- OIS Settings
- OIS Network Configuration
- Tag Database
- Screens and Screens Task-List, Touch-keys, if required.
- Global Keys
- Alarms
- Global and Power-on Task list

The complete configuration is stored as an Application. This application is downloaded in OIS60.

5.3.1.   OIS Settings:

OIS Settings define following properties of OIS60:

a.   Hardware Settings

-          Application Memory

The Application Memory of OIS can be changed using this option. *Use this if only you have purchased a nonstandard unit with a different memory option.*

b.   Screen Saver Enable

OIS60 also has a screen saver option for the unit. When no touch key action is performed for the time specified by screen saver time, display is turned off. Display is turned on when user touches the touch-key.

c.   Keypad Options

-          Keypad Queue Size

If a task for a key is in progress and another key is pressed, then the second key (latest pressed) is stored in a Key Queue. User can change the queue size using this option.

-          Queue full options

User has a choice to select what should be done if the queue is full and another key is pressed. Either the first or the last key pressed can be ignored.

d.   Float Format

This option defines how float data will be stored in the unit. Generally it is not required to be changed. It should be changed only when float format storage is different in a PLC.

e.   Printer Port Options

OIS60 has a Serial Printout Facility. User should connect Serial Printer cable to the Serial Port of the OIS60. Communication parameters for serial printing can be changed using this option.

-          Baud Rate

Baud Rates available are 300, 600, 1200, 2400, 9600, 19200.

-          Number Of Bits

Data bits can either be 7 or 8.

-          Parity

Parity options are Odd, Even, None.

-          Number of Columns

This is decided by the paper size of the serial printer. User can select the column size between 1 to 80 characters. After the specified number of characters OIS sends a Terminating character.

-          Terminating Character

Options for terminating character are None, CR, LF and CR+LF.

-          Maximum Characters of Screen

This option defines the maximum number of characters to be printed per screen. This option is applicable for the complete application.

5.3.2. OIS Network Configuration:

This setting selects the PLC Model, PLC type, Node number in a system. User can also connect multiple PLCs of the same type/protocol to a single OIS. Each PLC must have unique identification number which is termed as NODE ID.

5.3.3. OIS Tags:

Each register in the PLC memory has a unique address and can be identified by giving a specific name to it. This information is stored as Tag Data Base in OISetup32. Any coil or register to be used in the application must be first defined in the Tag data base.

5.3.4. Screens:

Operator views the PLC data on the screen of the OIS60 unit. Tasks can be defined for a screen. Also, the action for touch-keys when a screen is acting can be defined.

5.3.5. OIS Alarms:

Alarms can be defined in the Alarms Window. Alarms are defined on a single bit of any one word tag. All the tags must be defined before defining the Alarms. Alarms can be set on each bit in any Tag.

5.3.6. OIS Application Task-List:

Application Task List is of two types: Power-on Task-List and Global Task-List. Power-On Task-List is performed only once after the unit is powered on. Global Task-List is performed till the unit and PLC are communicating.

5.3.7. OISetup32 Menu Structure

Run OISetup32.exe. Following splash screen will be displayed.

Configuration software for OIS series Operator interfaces.
Version 1.10
© 2001 R.E.P.L.
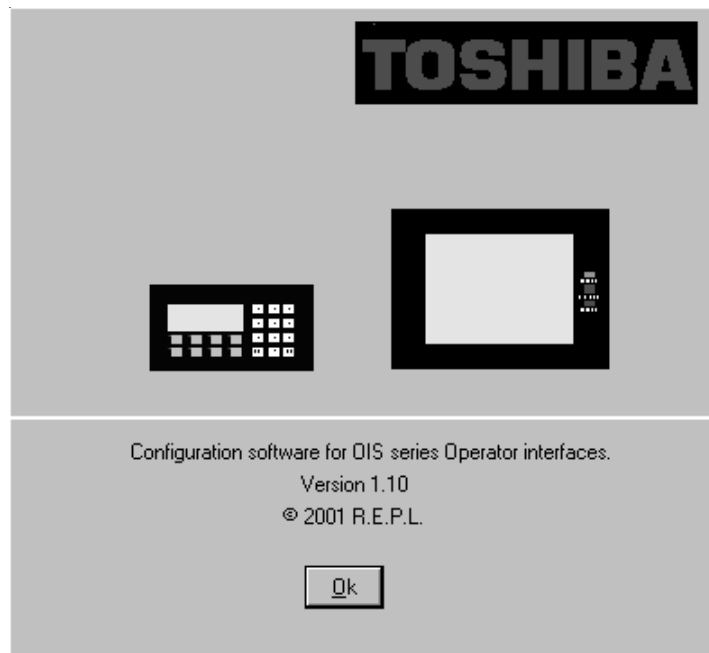
Main window will be displayed after the splash screen. Main window consists of two main parts: Menu Bar and the Tool Station.

OISetup32
File Communicate Utilities Help
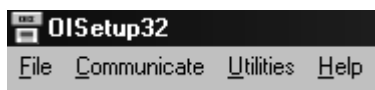
Menu bar operates like any standard Windows Menu bar. Click with mouse or use keys in combination with ALT key just like any other standard Windows based software. When no application is open above Menu bar will be displayed. From 'File' menu, select 'New...' to create new application. Following Menu bar will be displayed.

OISetup32 - [untitled]
File   Define   Communicate   Utilities   Help

The Tool-Station consists of icons. When the mouse points to any icon, a tool-tip is displayed. Click on the icon to select the particular menu.
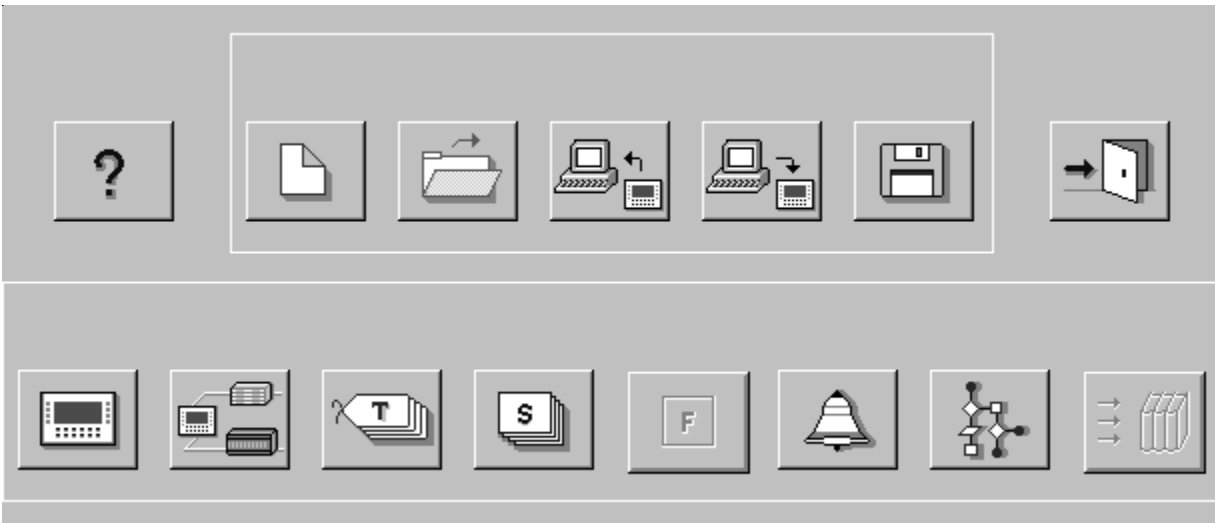
> ➢   ___File___ **Menu**

File Menu handles the file related functions.

OISetup32 - [untitled]
File   Define   Communicate   Utilities   Help

New...	
Open...	
Close	Ctrl+F4
Save	F2
Save as...	
Information...	
Print	
Exit	Alt+F4
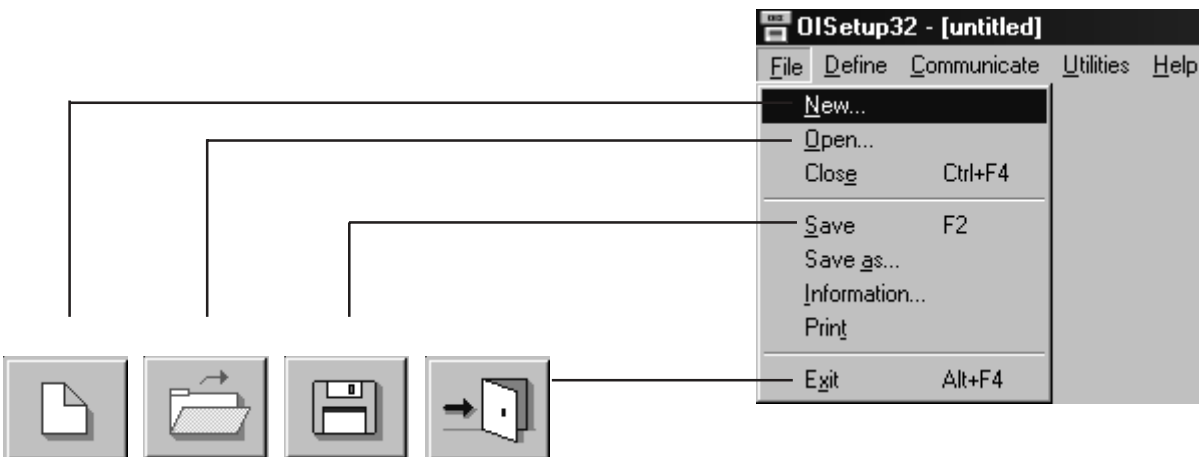
New   -   Creates a new application.

Open   -   Opens a saved application.

Close   -   Closes currently open application.

Save   -   Saves currently open application.

Save as   -   Saves the current application with a different name.

Information -   Application related information can be stored here. User can enter his comments here.

Exit   -   Exits OISetup32 Software

> ➤ **_Define_ Menu**

This menu defines the application. In the main window of OISetup32 software, bottom line of the icons is dedicated for this menu.
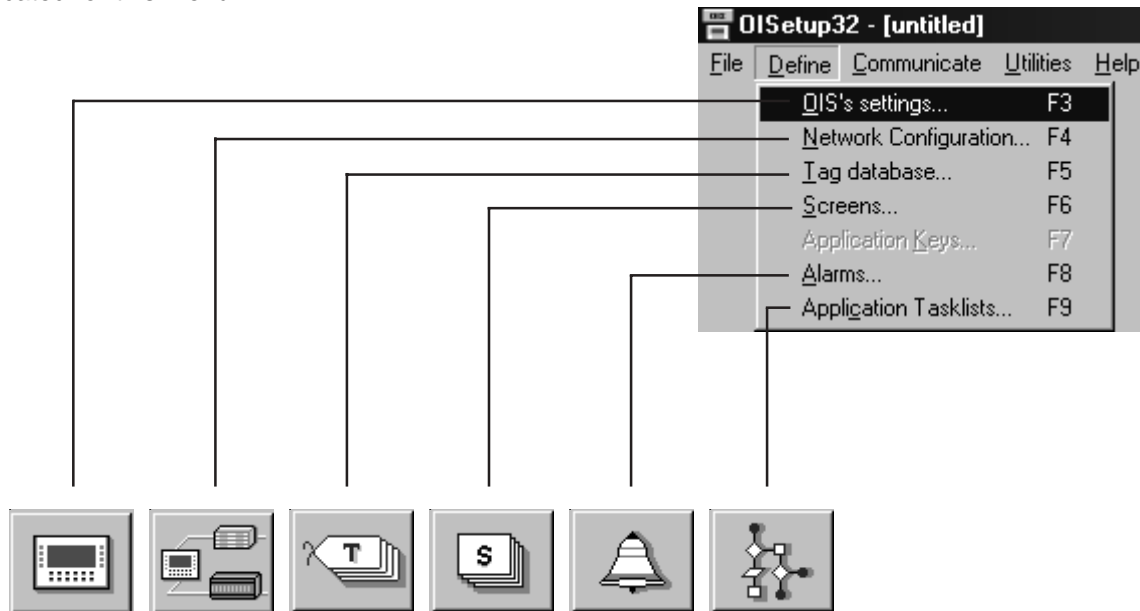
*O*IS Settings	-	Defines OIS settings. *Normally there is no need to change these settings*
*N*etwork Configuration	-	Defines PLC node, node ID etc.
*T*ag DataBase	-	Defines tags to be used in the application.
*S*creens	-	Defines screens.
Application *K*eys	-	Defines application keys.
*A*larms	-	Defines alarms in the application.
Appli*c*ation Task-List	-	Defines Power-on and Global Task-list.

> ➢ **Communicate** Menu

Communicate Menu Downloads / uploads application to / from OIS.
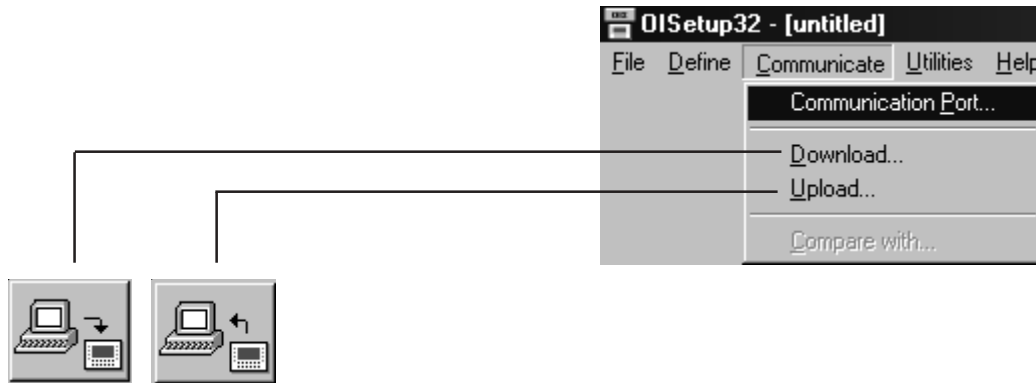
*Communication **P**ort*   -   Sets COM port for communicating with OIS.

***D**ownload*   -   Downloads Application to OIS.

***U**pload*   -   Uploads Application from OIS.

> ➢ **Utilities** Menu

Utilities Menu is basically useful for adding / removing PLC drivers.   It also informs the user about the memory used for the application.
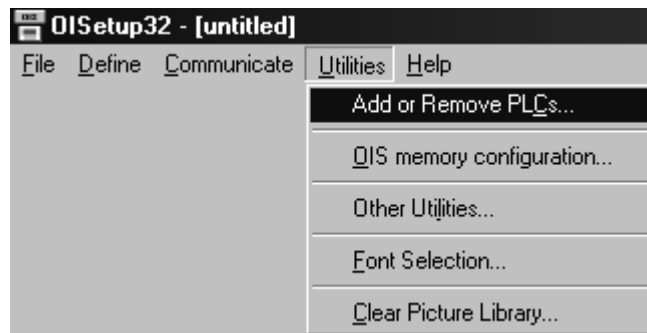
***A**dd or Remove PLCs*   -   Adds / removes PLCs to / from the Selected PLCs list.
                                  Close applications before adding or removing any PLC.

***O**IS Memory Configuration* -   Displays statistics of the memory used by the current

***F**ont Selection*   -   User can edit the fonts by the Font Editor utility.

***C**lear Picture Library*   -   User can clear the picture library. *Close applications before clearing Picture library*

➢ ***Help*** **Menu**

Help Menu, as the name suggests, offers help for the user application.
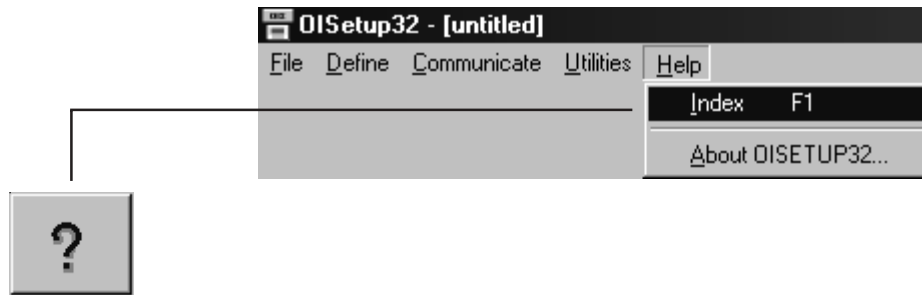
*I*ndex   -   Lists all the Help topics

*A*bout OIS   -   Displays the software version number.

5.3 Create New Application

Select *New* from *File* menu or click on the *New Application* button.

OR
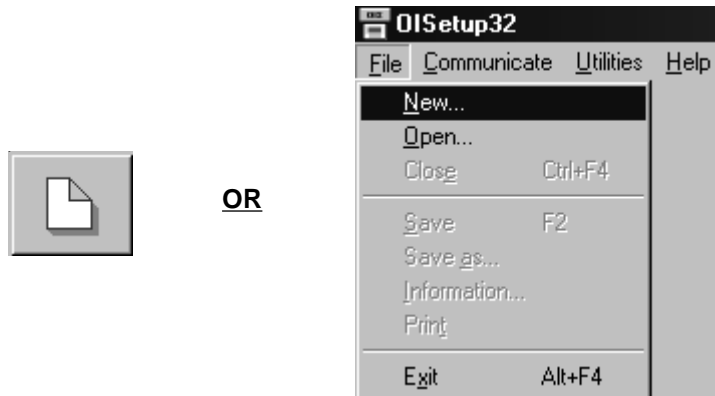
In the dialog presented, select OIS60 model and press *OK*.
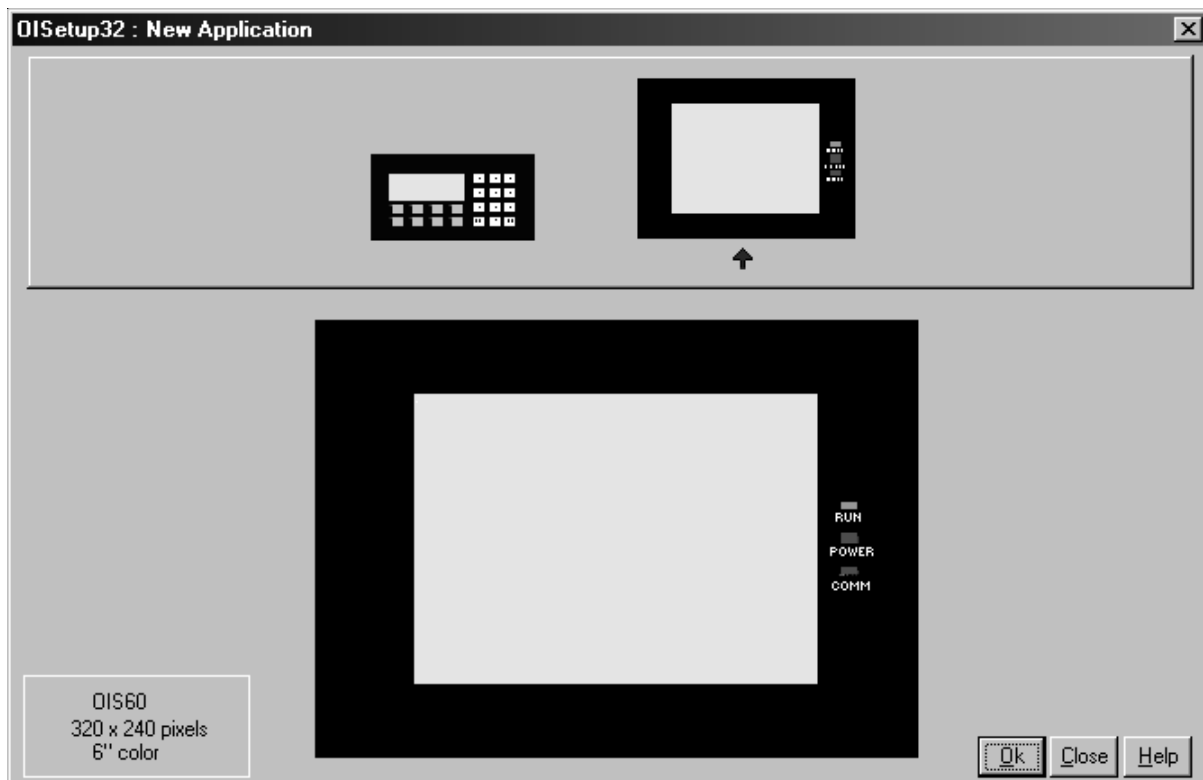
Select *OIS Settings* from *Define* menu or Press *F3* key or click on the *OIS Settings* button.

OR
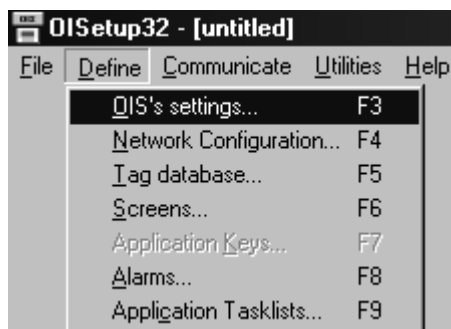
In OIS Settings dialog box, select Application memory, Screen Saver, Float format, Key Queue Size, and Serial printout options. Press *OK* to accept the selections made.
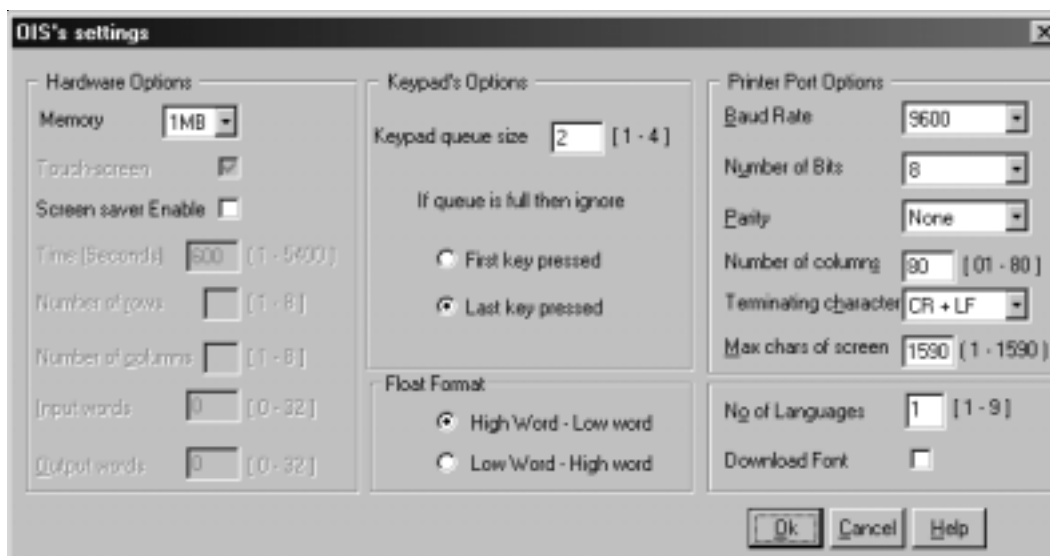
Select PLC to be used in the system. Select *Network Configuration* from *Define* menu or Press *F4* key or click on the *Network Configuration* button.

OR
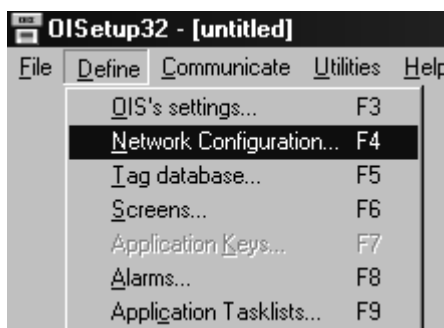
In Network Configuration dialog box, Press **Add a Node** button. Now select PLC and PLC Model. Assign a Node Address for the node Press **OK** to accept the selections made. If another node has to be added repeat above steps else press **Close.**

Select **Tag Database..** from **Define** menu or Press **F5** key or click on the **Tags** button.

In Tags dialog box select the Node, Tag type, Register, enter Tag name and finally select number of bytes for the Tag. Press **Add** to accept the Tag. After adding all the tags press **Close** button.

Select **Screens..** from **Define** menu or Press **F6** key or click on the **Screens** button

    OR

In **New Screen** dialog box, enter the Screen number, Screen Name, Password, Screen Name and Screen description information. This is for programmers reference only. This information is NOT displayed on the actual OIS Screen. Select Screen background color. Associated Screen option is available only when some screens have already been defined. Click **OK** to enter the **Screen Editor Window**.

In the **Screen Editor** user can define Screen Objects, Screen Keys and Screen Task List. To place an object, click on the respective button in the **Objects** window. Pointer will take the shape of the object. Click the mouse at the required location on the screen to place the object. All the tag dependent objects will allow user to access the Tag data base from their dialog box. Clicking on the **Selector** button or another object button deselects the object selected. Standard Windows operations like Copy, Cut, Paste Objects, Redo, Undo, etc. are available in **Tools** window. Screens can also be duplicated using the duplicate button. To exit from the **Screen Editor**, click on the **Close** button of **Screen** Window. In the following points Screen is explained in detail.
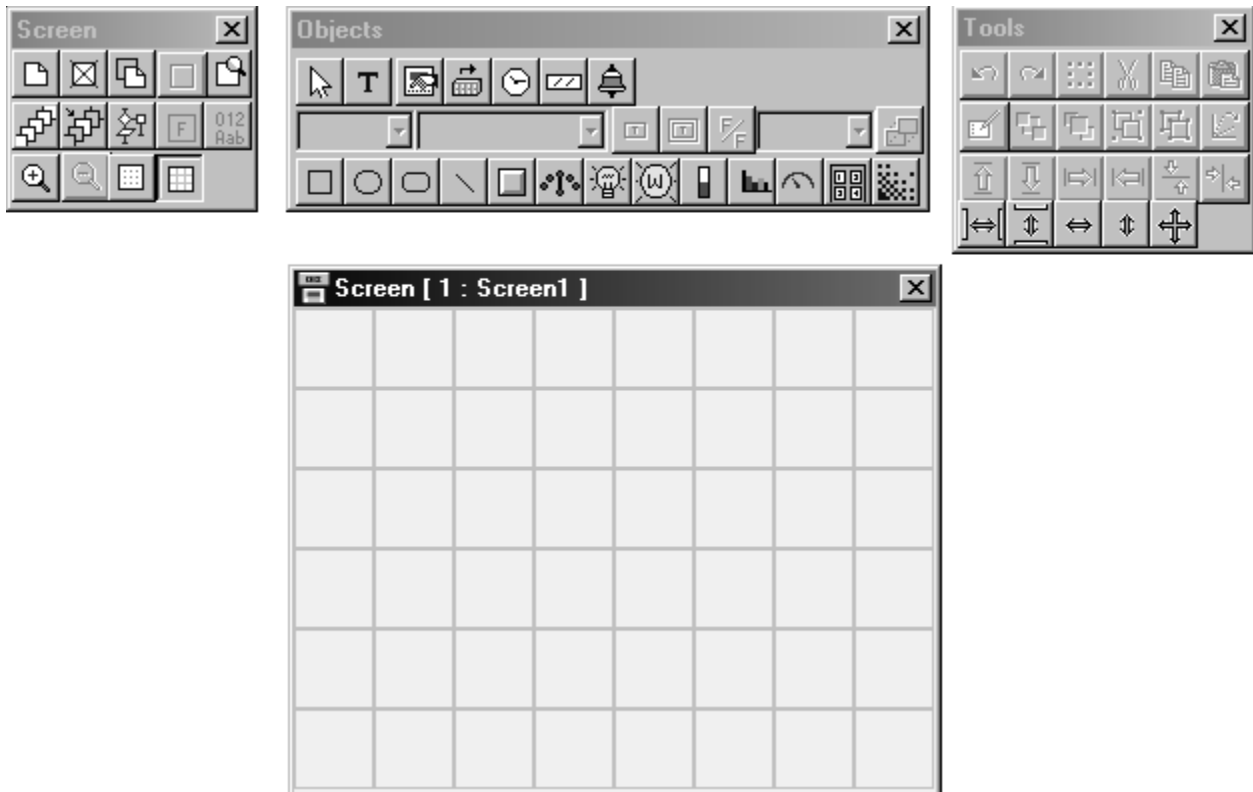
Text Object:

Click on the **Text** button [T]. The shape of the mouse pointer will change. Select the required Font Size Text Foreground color, Text Background color. Now place the mouse pointer at desired location and mark the area of text object while holding the left mouse button. Even if no area is marked, user can enter the text and later edit the object size. A block cursor will blink at the location inside the text outline. Now enter text. The last character will be overwritten If the INSERT Mode (Computer Keyboard) is disabled, else new character will not be accepted.
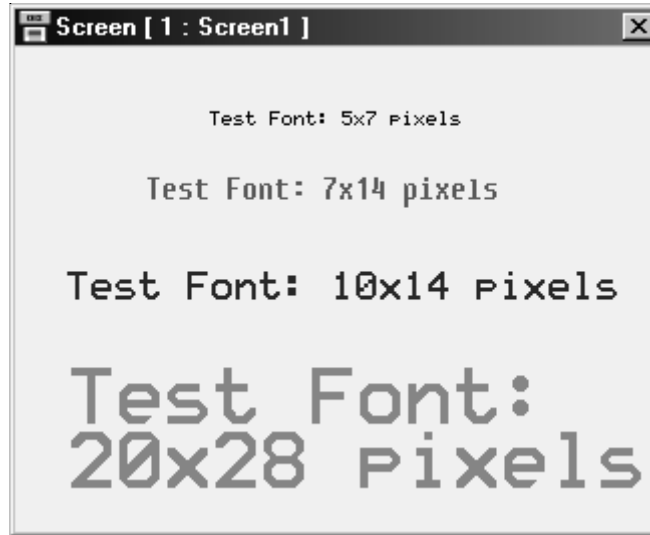
Coil Data Entry Object:

Click on the **Data Entry** button [🖼]. The mouse pointer will change to the tool shape. Now place the mouse pointer at desired location and click the left mouse button. The data entry dialog box will appear. This box will allow user to select between Coil and Register Data entry. If Coil data entry is selected fields to be completed are Coil Tag and on / off text.
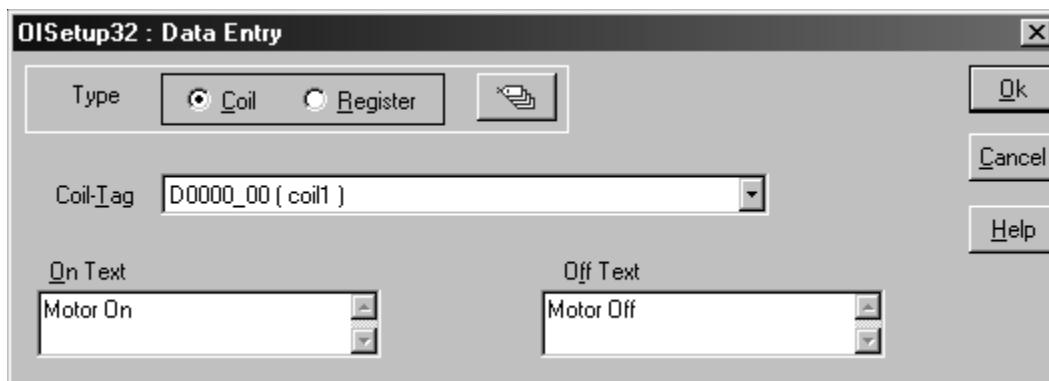
Register Data Entry Object:

To edit a register in the PLC, select **Register Data Entry** in the Data entry dialog box. Register Data Entry dialog box allows user to select the tag, Data type, data format, low limit, high limit, Math -1st and 2nd operation. In tag selection window, there is the list of Tags available where data can be written. You can select the one you want from the list. The list will NOT display any read only registers which can not be modified. Data entered can be limited by assigning a Low and a High limit for the data entry. Data can be entered in various types namely., Unsigned Integer, Signed Integer, Hexadecimal, BCD, Binary (1 word) and Float. Data format should be selected by the user. Default format is Unsigned integer. Low and High limits restrict the data that can be entered in the register. Two mathematical operations can be performed on the data be entered. *Please ensure to place a **Numeric Keypad** object on the screen.*

Display OIS / PLC Data:

This object can be used to view PLC / OIS. To place embedding object click on 'Display OIS / PLC Data' Tool . In the dialog box user can select either **Bit Text, Register value or Register Text**.

Bit Text displays text depending on the status of a coil or bit. **Register Value** displays the value of the register. User can scale the register value by performing math operations on the tag value. **Register Text** displays text depending on the value of a register. Text is defined for various ranges of a register tag.

To add **Bit Text** object, select **Bit Text** in the **Display OIS or PLC Data** dialog box. In the window, user can enter text to be displayed depending on the state of a Coil.

To display value of a word tag, select **Register Value** type in **Display OIS or PLC Data** window. The window will now change to display Register options. Select the register to be displayed. Select the **Data type** and **Format** to display the register. User can scale the value by performing math operations. 1st and 2nd math operation set the math operators. **Leading Zero Blank** option decides whether zeros preceding the value will be displayed or not. If this option is enabled then register value will be displayed without Leading Zeros.

Register Text Object is value dependent text object. User can define different text strings for different ranges of register values. When the value is between a defined range, corresponding text is displayed. First select the register from the **Tags** list. Now enter low limit, high limit and text for that range. Click **Accept** button to accept the entered data. Now click **Add** to enter new limits and corresponding text.

<u>Display Date Object:</u>

The date can be displayed on the OIS display by placing a **Display Date** object. To display the object, click on the **Date** button [☐]. Place Date Object on the screen. To edit the format double click on the object. In the dialog box, the user can either select DD/MM/YY format or MM/DD/YY format.
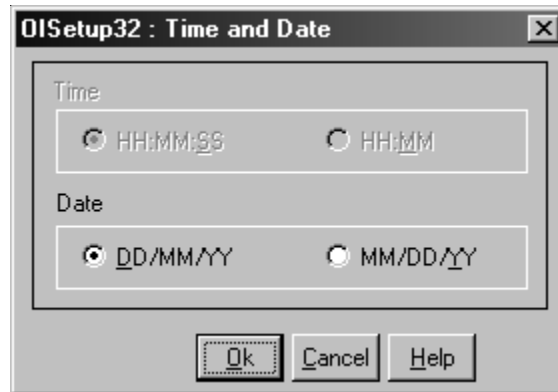
<u>Display Time Object:</u>

Time can be displayed on the OIS display by placing a **Display Time** object. To display the object, click on the **Time** button [☐]. Place Date Object on the screen. To edit the format double click on the object. In the dialog box, the user can either select HH:MM:SS format or HH:MM format.
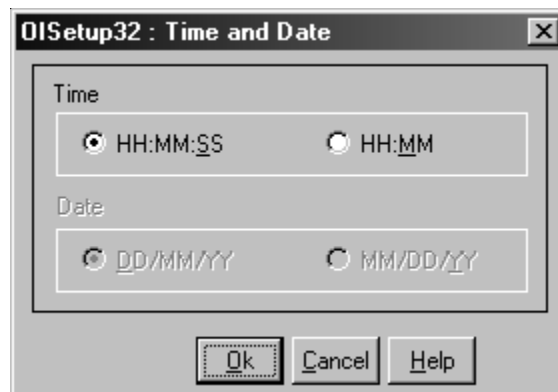
Display Alarm Object:

An Alarm object displays an alarm immediately after any alarm is triggered. Alarm text is defined in the **Alarms** dialog box. To place an Alarm object, click on the **Alarms** button ⊟. Alarms objects can be edited by double clicking on the object placed on the screen. **Alarms Dialog box** will enable user to select the fields to be displayed in an **Alarms** object. Sequence and length of each field can also be varied. Alarms tag and text must be defined from **Define Alarm** window.

OISetup32 : Alarm Window Options

Which and how to display the Alarms

All triggered alarms (First triggered on top)

Select From
Tag
OnTime
OffTime
Active

Add
Delete
Up
Down

Selected
Alarm Text
Number
Acknowledged

Format

	Y/N	Yes/No
Active	○ Y/N	○ Yes/No
Acknowledged	○ Y/N	● Yes/No
Print	○ Y/N	○ Yes/No

Ok   Cancel   Help
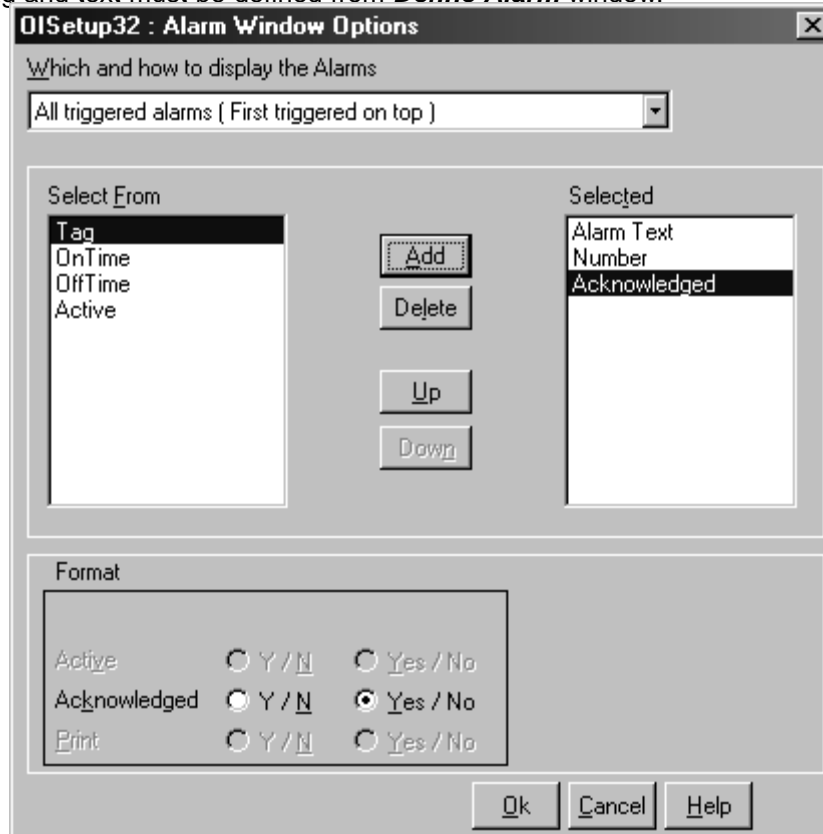
Display Rectangle Object:

User can draw rectangle on the OIS display by using a Rectangle tool. To draw the object, click on the **Rectangle** button ▢ . Place the tool on the screen, drag till required size is reached. To edit the object, double click on the rectangle. In the dialog box, the user can select size and location of the rectangle.

Rectangle

Dimensions

Top-Left Point	X	76	Width	186
Top-Left Point	Y	24	Height	114

Ok   Cancel   Help
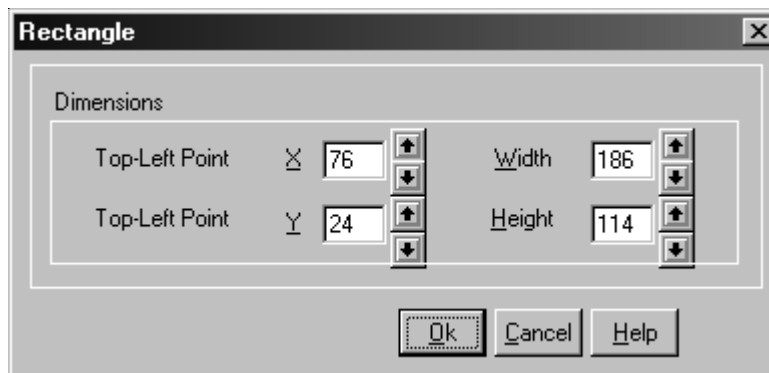
<u>Display Ellipse Object:</u>

User can draw ellipse on the OIS display by using a Ellipse tool. To draw the object, click on the **Ellipse** button 〇 . Place on the screen, drag till required size is reached. To edit the object, double click on the object. In the dialog box, the user can select size and location of the Ellipse.
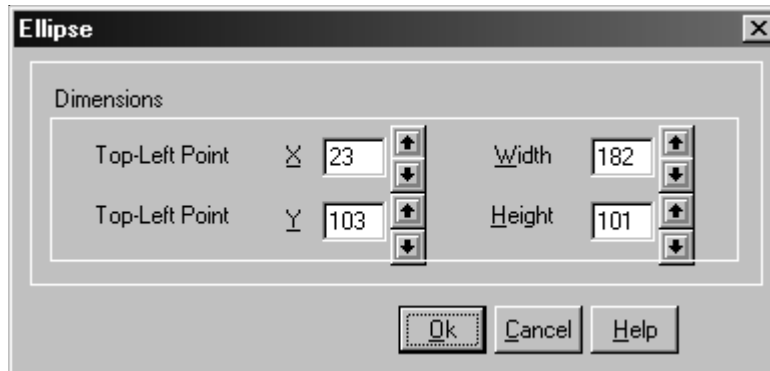
<u>Display Rounded Rectangle Object:</u>

User can draw rectangle with rounded corners on the OIS display by using a Rectangle tool. To draw the object, click on the **Round Rectangle** button ▱ . Place on the screen, drag till required size is reached. To edit the object, double click on the object. In the dialog box, the user can select size and location of the rectangle.
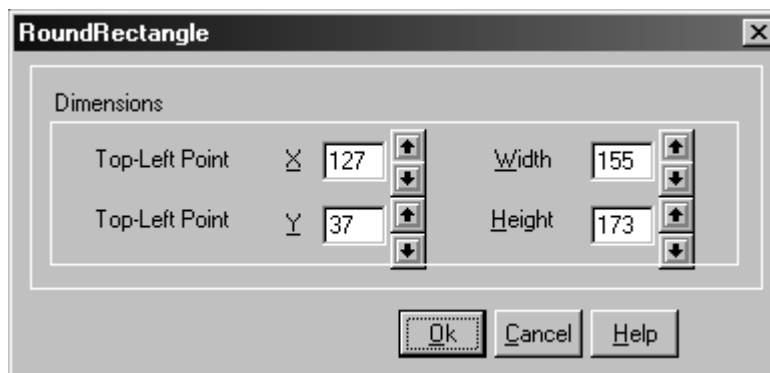
<u>Display Line Object:</u>
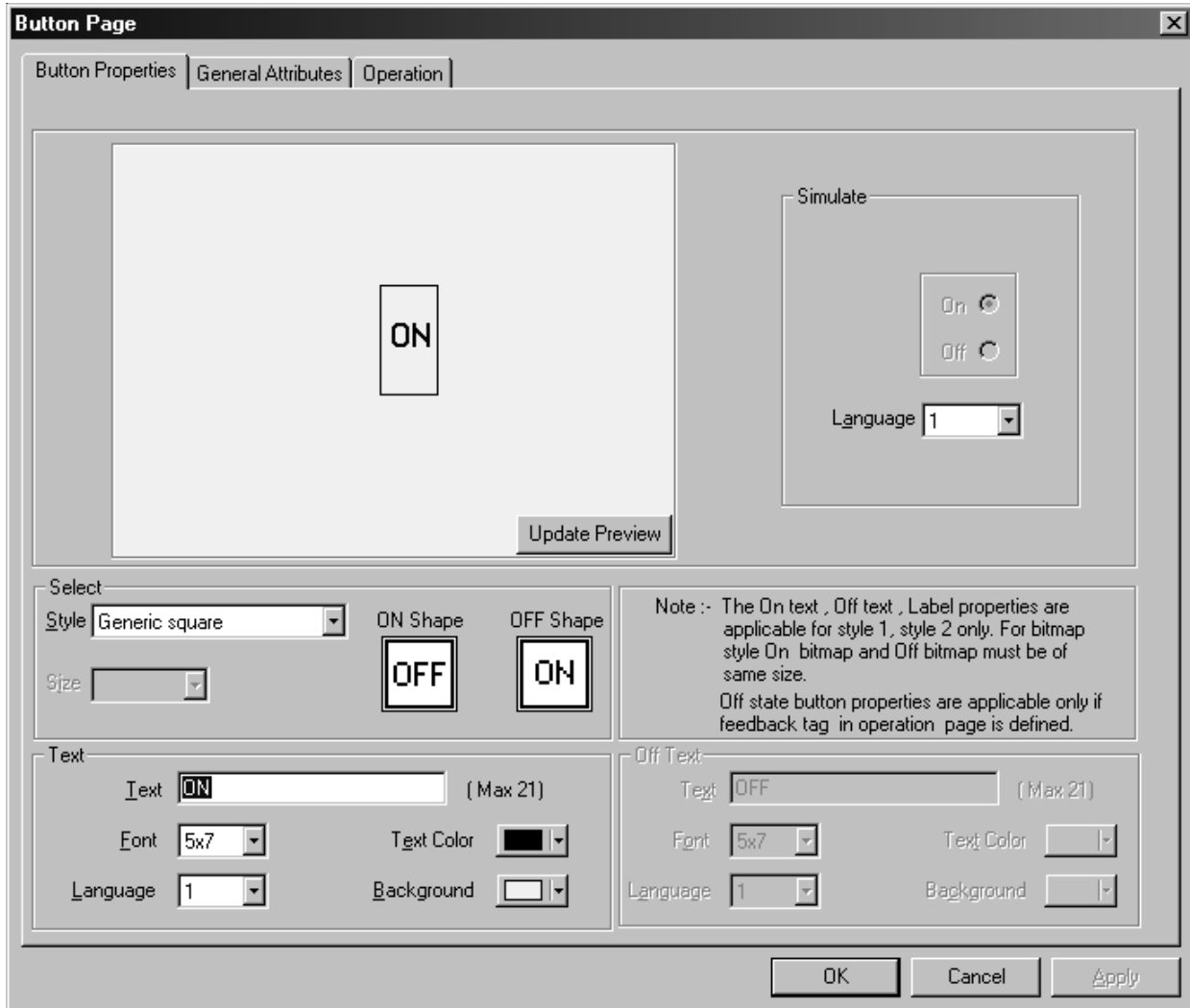
User can draw Line with rounded corners on the OIS display by using a Line tool. To draw the object, click on the **Line** button ＼ . Place on the screen, drag till required size is reached. To edit the object, double click on the object. In the dialog box, the user can select size and location of the rectangle.

Page 41
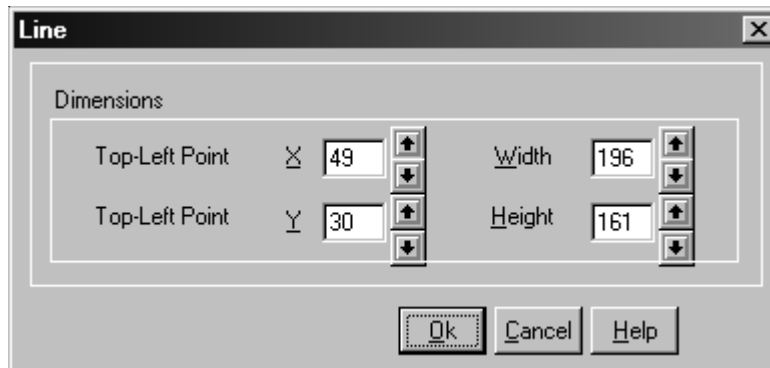
Bit Button Object:

To draw the object, click on the **Bit Button icon** ☐ . Place on the screen. Dialog box window will enable user to select Button properties, General Attributes and Operation. Button Properties defines the properties of actual button object. General Attributes page is similar for all the wizard objects. This page defines the label, border properties. Operation page defines the action for touch key and Feed back tag. Feed back tag status defines the shape of the button, on text, off text. Operation does not vary on the Feedback tag. The presentation of the button on the display is decided by the feedback tag.

Word Button Object:

To draw the object, click on the **Word Button** icon . Place on the screen. Dialog box window will enable user to select State properties, General Attributes. User can define different tasks depending on different states (ranges) of a word tag. Button display can also be varied depending on the state of the tag. General attributes define the label properties and border enable / disable.
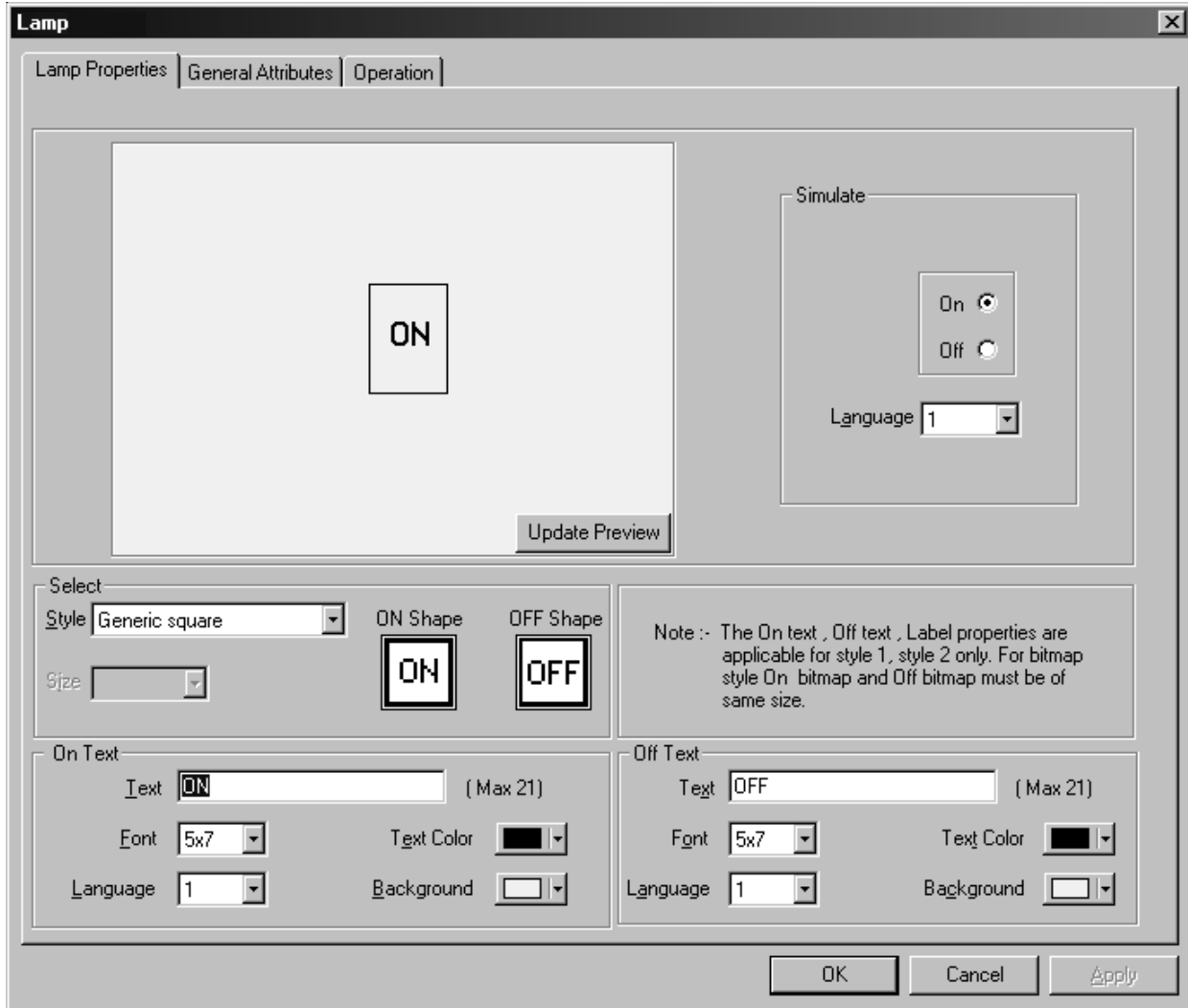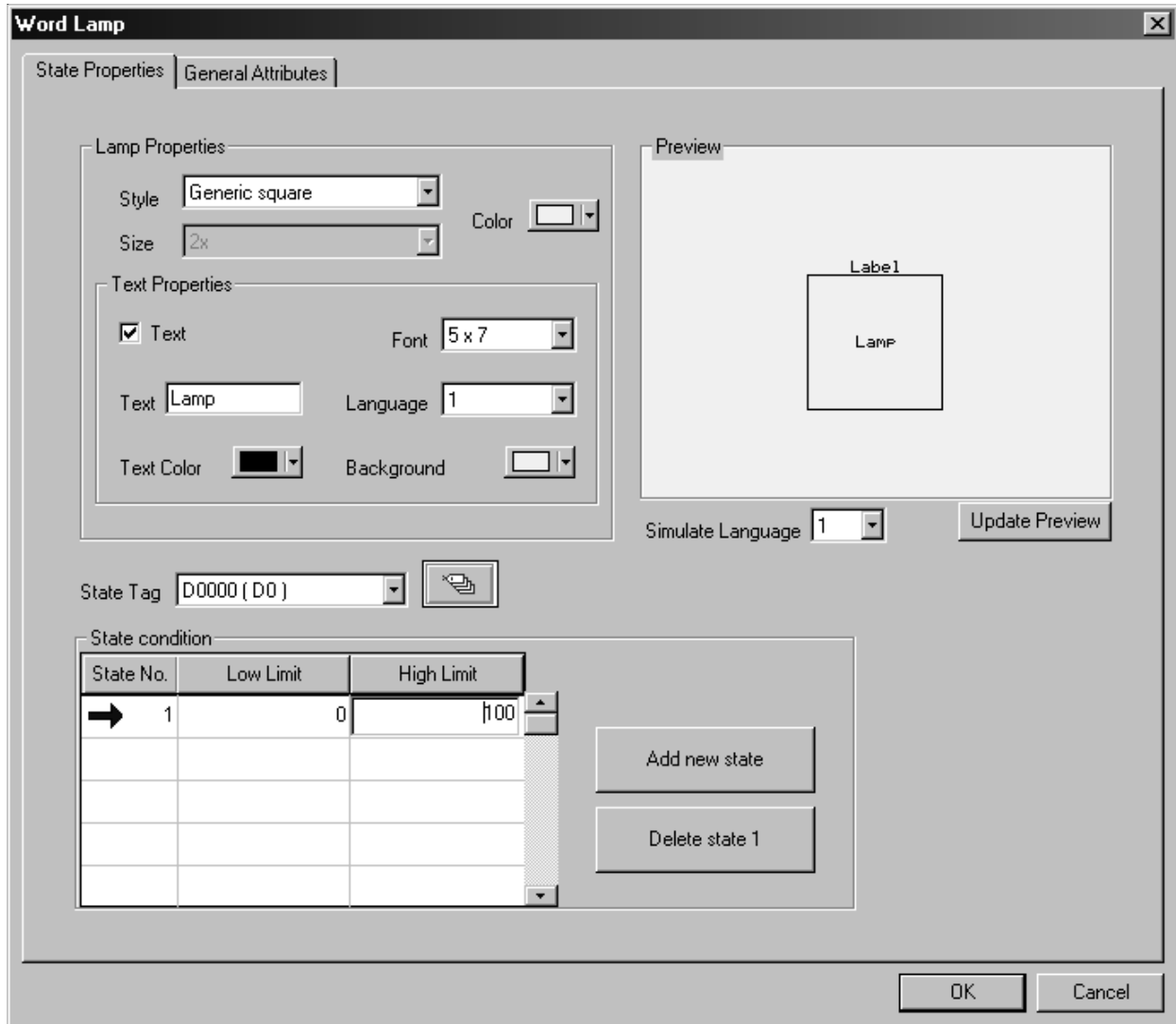
Bit Lamp Object:

To draw the object, click on the **Bit Lamp** button 🔆. Place the tool on the screen. Dialog box with three pages will be presented. Lamp properties page defines the display of the actual lamp. General attribute defines label properties and border enable / disable. Operation page defines the feedback tag (coil). Status of this coil changes the bitmap of the lamp.

Word Lamp Object:

To draw the object, click on the **Word Lamp** button [W]. Place the tool on the screen. This object displays various bitmaps depending on the states of a word tag. Place the tool on the screen. A dialog box with two pages will be presented. Two tags, State Properties and General Attributes decide how the object will be displayed. State defines the range of the State tag (word tag). For each state different bitmaps can be defined.

Single Bargraph Object:

To draw the object, click on the **Single Bargraph** button ▯. Place the tool on the screen. User can select style to plot a bar for the specifies word tag. Maximum and Minimum limits specify the range of tag to be plotted. Select Fill color for the bar.

Multiple Bargraph Object:

To draw the object, click on the **Multiple Bargraph** button [icon]. Place the tool on the screen. User can select number of bars, style, bar width. Individual bar properties sets Bar tag, Bar color, Maximum and Minimum limits.
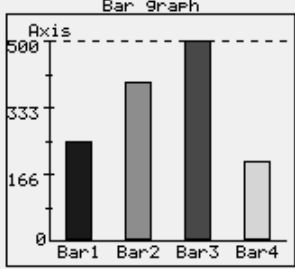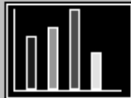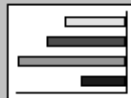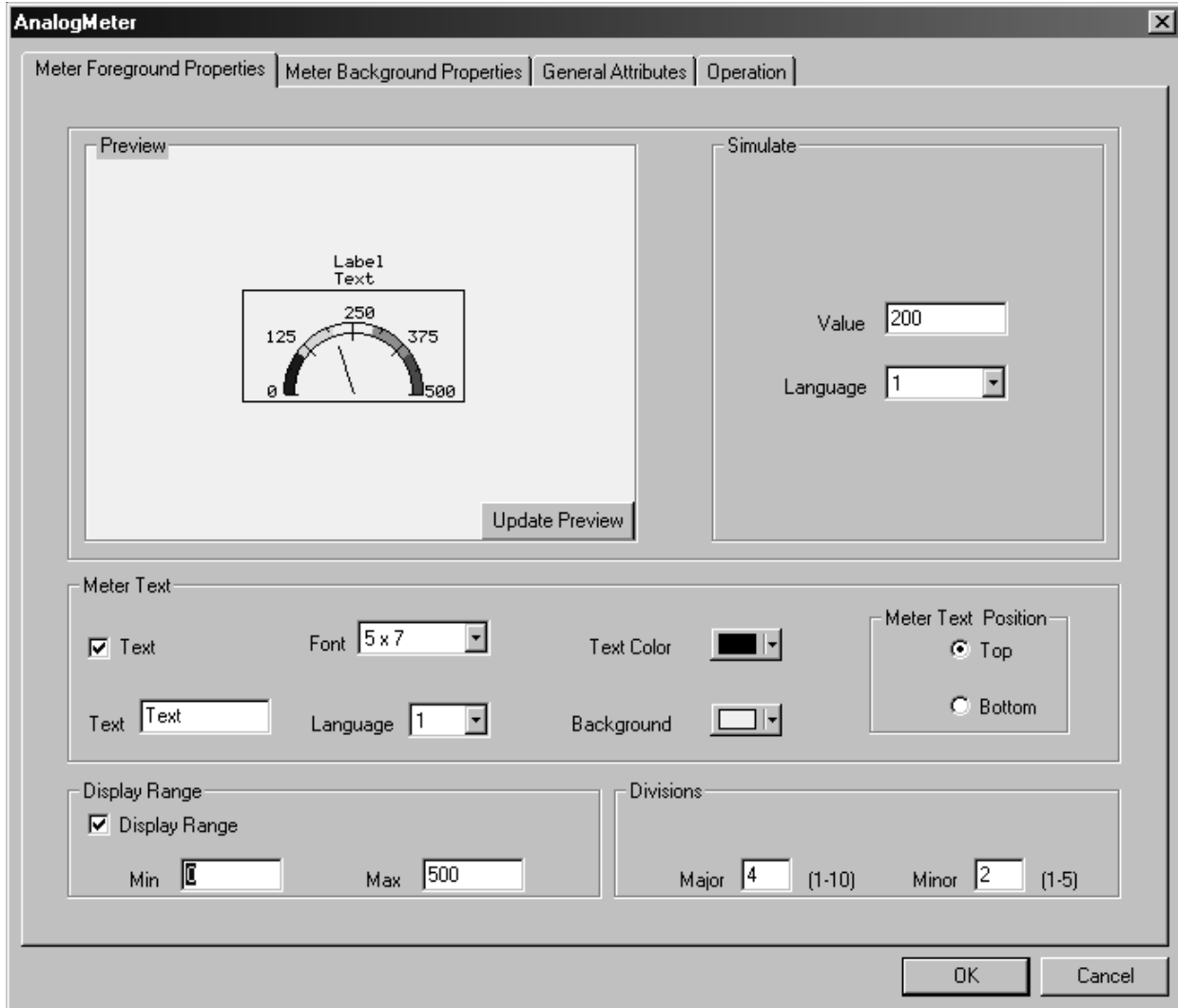
Analog Meter Object:

To draw the object, click on the **Analog Meter** button ⌂ . Place the tool on the screen. This wizard
represents the word register on a analog meter. Dialog box has four pages: Meter Foreground properties,
Meter Background properties, General Properties, Operation. Foreground Properties define Meter divi-
sions, meter text, text font, color, display range. Background Properties define needle color, Meter style,
Color range settings. General attributes define label properties and border enable / disable. Operation
page defines meter start angle meter end angle, word tag for meter, meter range.
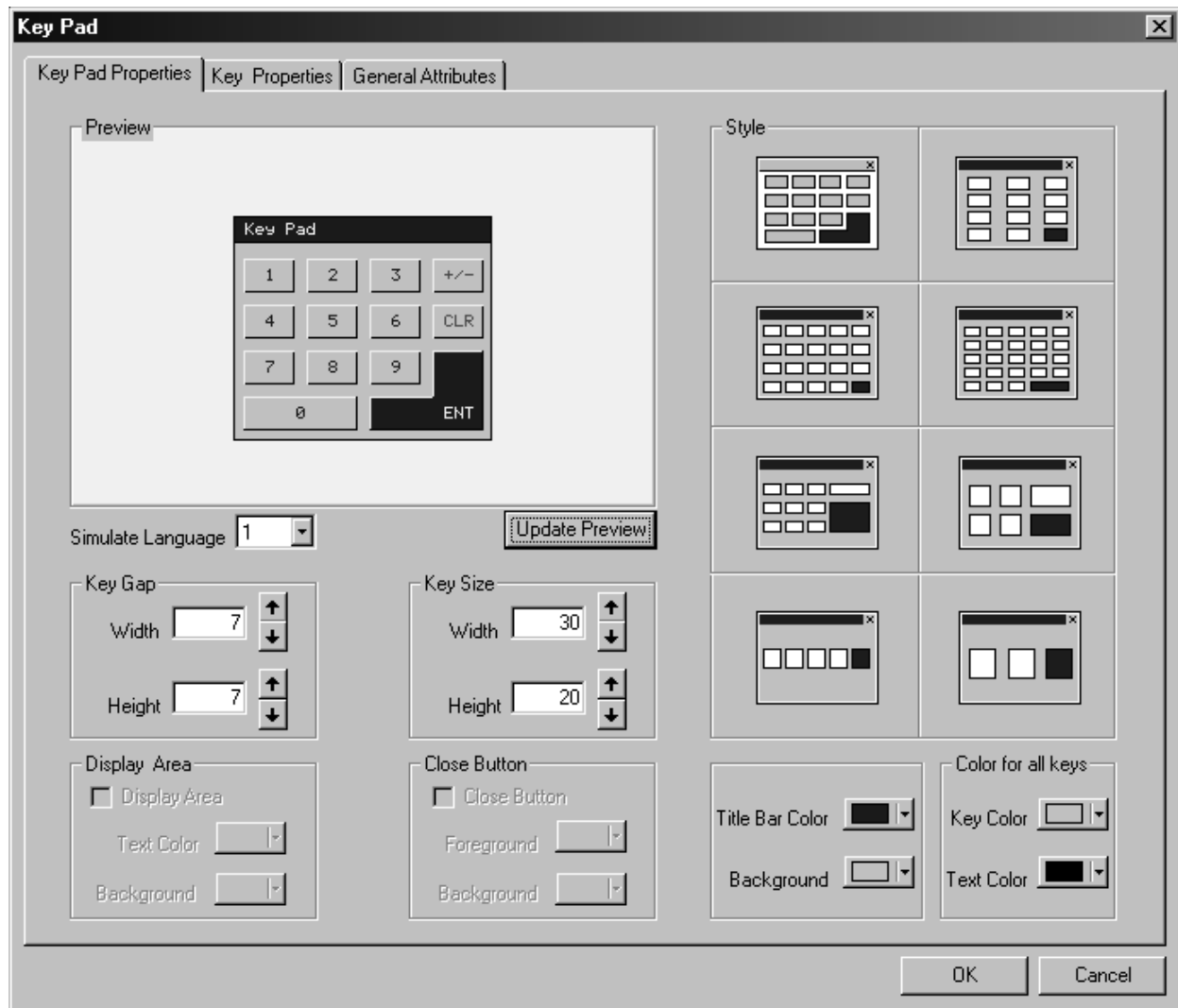
Numeric Keypad Object:

To draw place object, click on the **Numeric Keypad** button ▦. Place the tool on the screen. This wizard helps user to edit any data. Numeric keypad has to be placed on the screen which has a data entry object. Various formats are available to select most appropriate format.

Bitmap Object:

To display a user defined bitmap, click on the **Bitmap** button. In the dialog box presented user can add bitmap to library, delete a bitmap from the library or add a library bitmap to screen. User can add any required bitmap. Any 256 color bitmap can be added to the bitmap library.
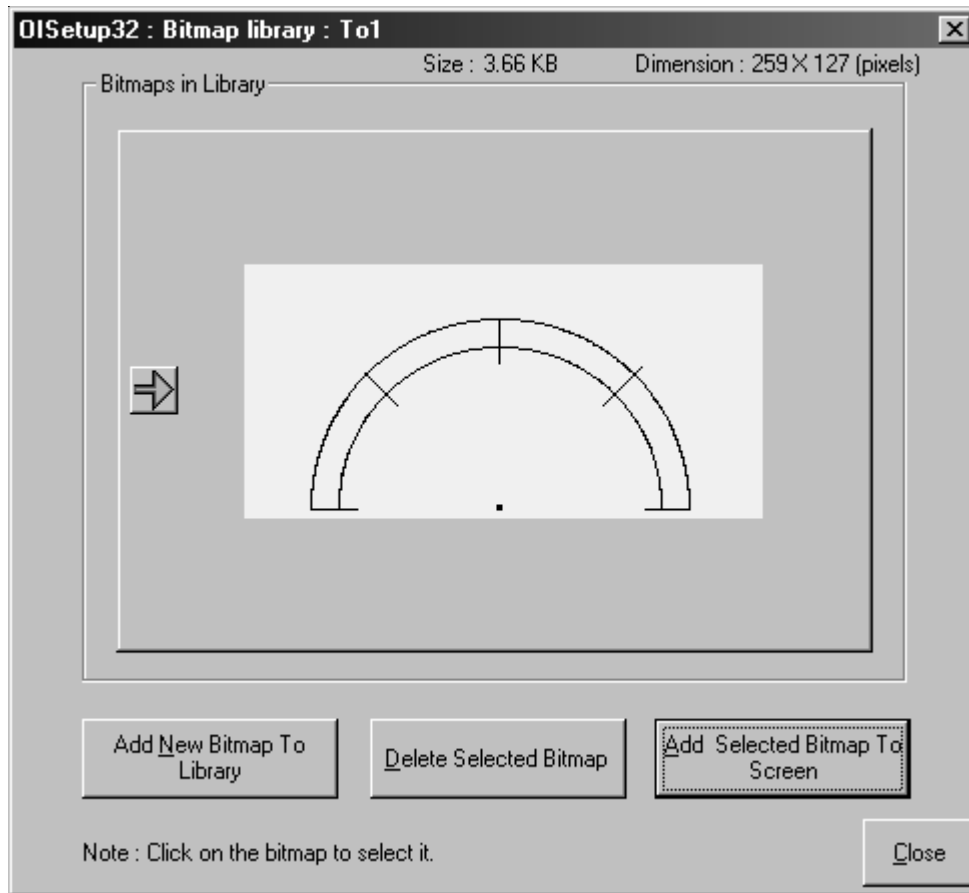
Once all the screens are completely defined, user has to define the '**Power-on Application Task'**. Power-on Application Task is like a boot-up sequence for the unit. Tasks mentioned here are performed immediately after the unit is powered on.

Here user has to specify the screen to be displayed after the unit is powered on. User can either use 'Goto Screen' task or 'Copy tag to STR' task. 'Goto ..' task will write screen number to Screen Triggering Register (STR) and display the screen specified by STR. 'Copy tag..' task will copy the specified PLC tag to Screen Triggering Register. Screen Specified by STR will be displayed. Default Power on task is 'Go To Screen 1'.

If user wishes to perform some tasks continuously, these tasks should be defined in the Global Task-List. This completes the application. Now this application has to be saved and downloaded. Global tasks are not mandatory.

5.4 **Save and Download Application**

Complete application has to be saved. Click '**Save**' from **'File'** main menu or press **F2** key on the PC keyboard.

OR
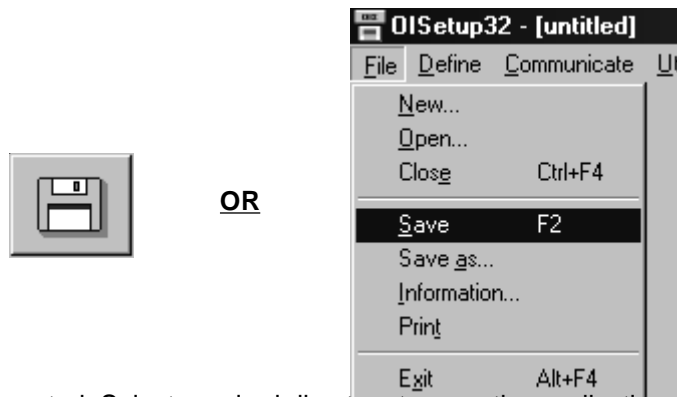
 A dialog box will be presented. Select required directory to save the application. Enter the name to save the application. Click '**Save**' button.
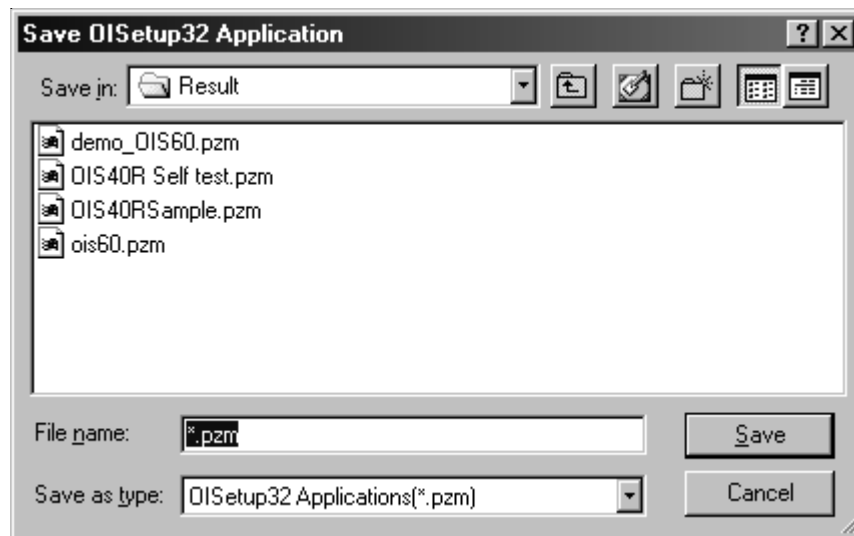
Application has to be downloaded to OIS60. From **'Communicate'** menu, click **'Communication Port'**, select appropriate communication port of your IBM PC. Attach IBM PC to OIS60 cable. From **'Communicate'** menu, click **'Download..'**.

OR
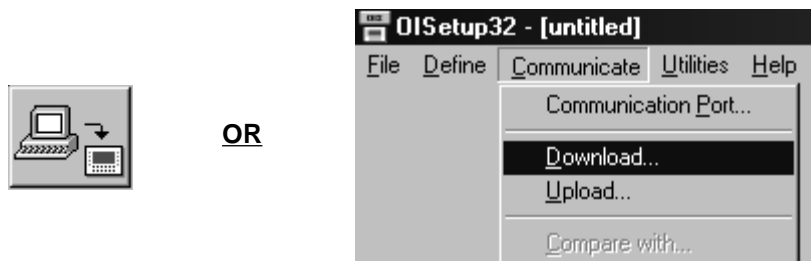
In the download dialog box, check **'Application'** radio-button. Press **'OK'** button to download application to OIS60 unit.
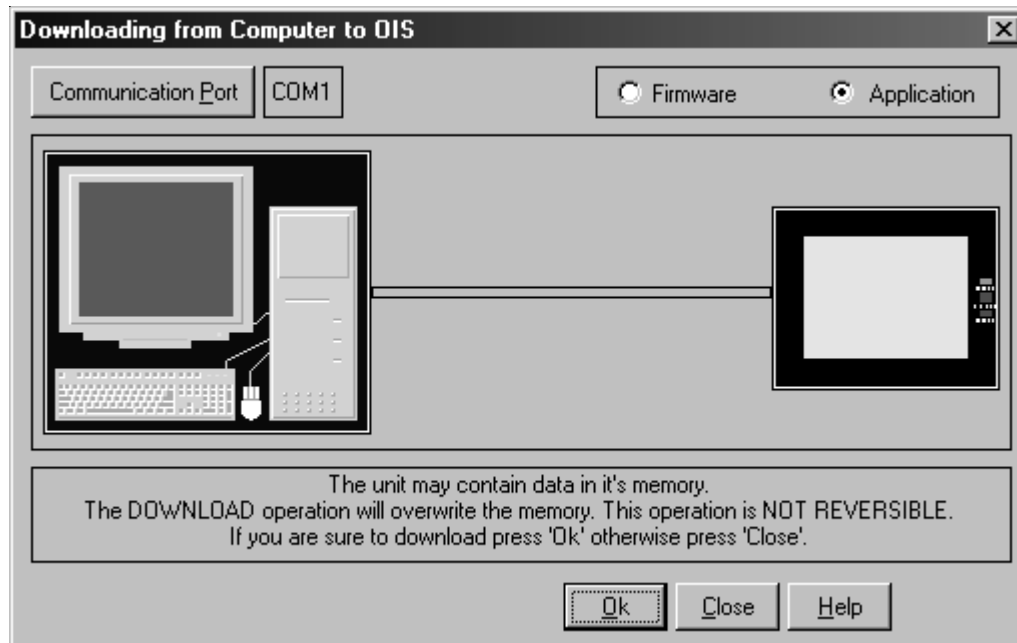
Now application will be executed.

6. APPLICATIONS EXAMPLES

In this Chapter

> **Installations and Setup**
> **Define Node and Tags**
> **Define Screens**
> **Define Alarms**
> **Load Applications into OIS60**

6.1   Installations and Setup

We will create an application for OIS60. The application will be for internal tags only. Do the following:

6.1.1. Click on the OISetup32 icon to run OISetup32 .

6.1.2   When the main window is displayed, click on the New Application icon

6.1.3. From the New application dialog box, select the OIS60 model. Click **OK** to accept the selection made.
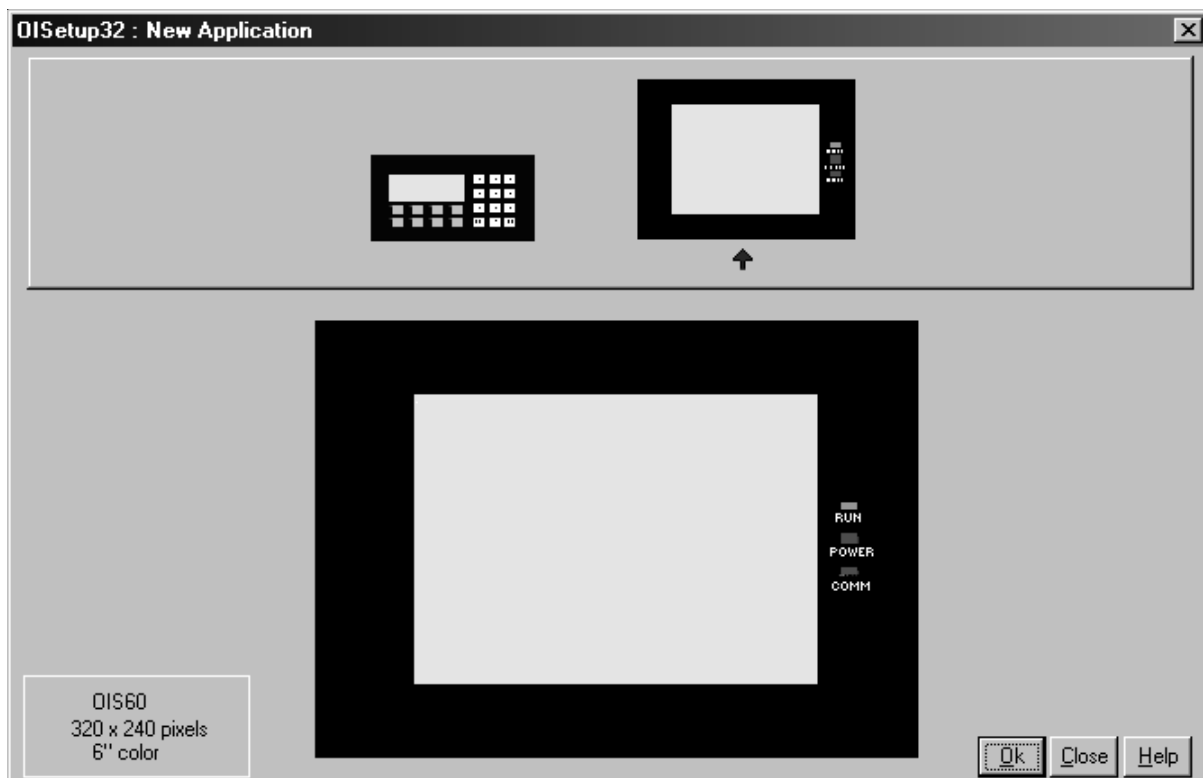
6.2   Define Node and Tags

6.2.1.   As said earlier, this application is being developed with internal tags only, hence we will not be adding any PLC in the network.
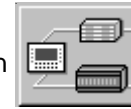
If user wants to add PLC in the network, click on the Network Configuration icon [icon]. Click on

'Add a node' button. From the **'PLC'** list, select the PLC required. Select the required model for the PLC. Enter the Node ID number. Click **'OK'** button to accept all the selections made.
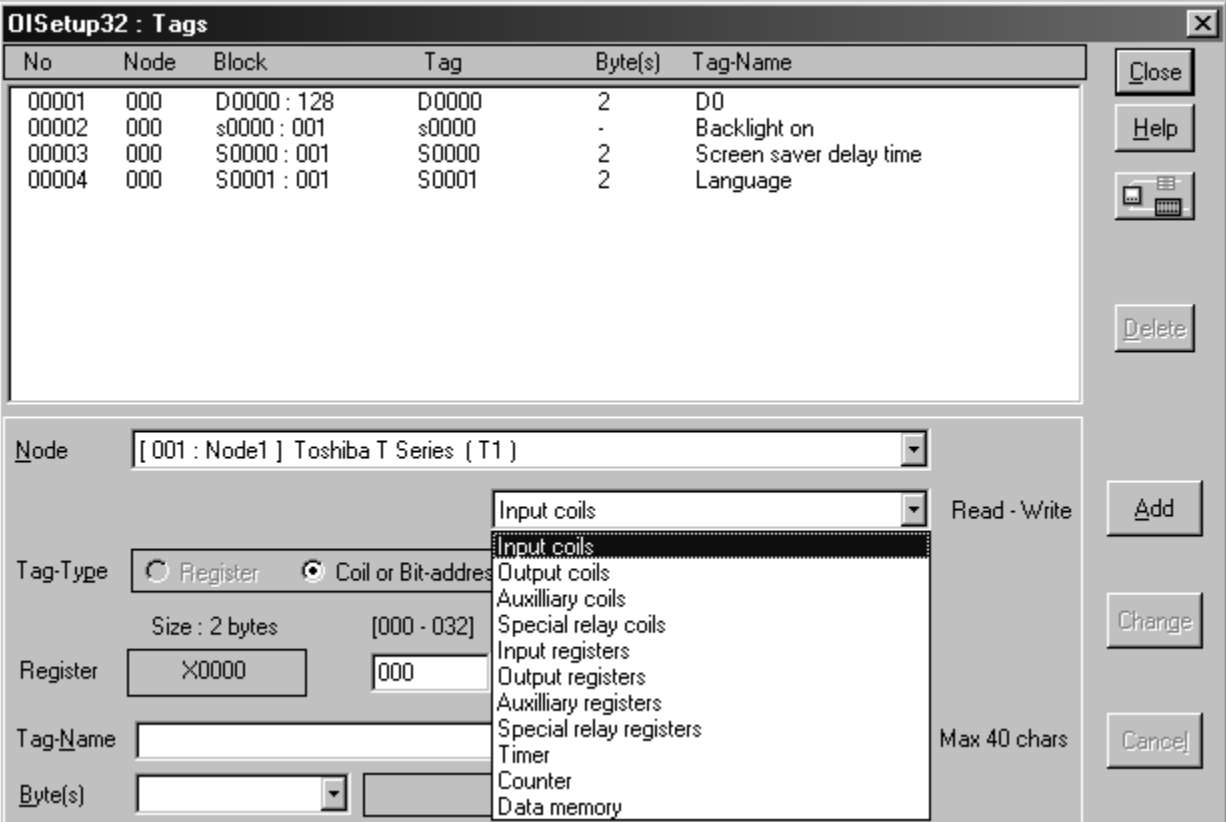
6.2.1.   We have to define tags required for the application. It is a good practice to define the tags before

developing the application. To define Tags click on Tag Database icon [T]. Following dialog box

will be displayed. Select required register type and register address, enter your name for the tag.

Click on the **'Add'** button to accept the tag defined. To define a coil, change the selection **Tag-type**. Enter coil number, tag name and click **'Add'** to accept the tag entry. Click on Close button to close the Tag Database window.

No	Node	Block	Tag	Byte(s)	Tag-Name
00001	000	D0000 : 128	D0000	2	D0
00002	000	s0000 : 001	s0000	-	Backlight on
00003	000	S0000 : 001	S0000	2	Screen saver delay time
00004	000	S0001 : 001	S0001	2	Language

Node   [001 : Node1] Toshiba T Series (T1)

Input coils   Read - Write

Input coils
Output coils
Auxilliary coils
Special relay coils
Input registers
Output registers
Auxilliary registers
Special relay registers
Timer
Counter
Data memory

Tag-Type   ○ Register   ◉ Coil or Bit-address

Size : 2 bytes   [000 - 032]

Register   X0000   000

Tag-Name

Byte(s)

Max 40 chars

Add

Change

Cancel

Define an internal coil D000_000 as 'Coil 1' and an internal Tag D0001 as 'D0001'. We will use these two tags in this application.

6.3   Define Screens

6.3.1 . Now we will define Screens. Screens form the most important part of any application as it displays the information required by the operator. OIS has various objects to make a screen

operator-friendly. Click on Screens icon to define screens [$] .

In the Screens dialog box, enter the screen number, name and password. Select screen background and screen type. Screen type is
> Display: Screen will be displayed and will perform all tasks.
> Print Only: Screen will only be printed after it is triggered.
> Both: Screen will be displayed and printed after it is triggered.

Click '**OK**' to create a new screen. Screens window will now appear on the monitor.

On the screen we will define following objects:
> Plain Text
> Data entry for Coil 1 and D0001.
> Bit Lamp dependent on coil 1.
> Analog Meter for D0001.
> Alarm Object Alarm will be triggered by D0001
> 4 Bit Buttons for Alarm Operations: Acknowledge, Next Alarm, Previous Alarm and Clear Register.
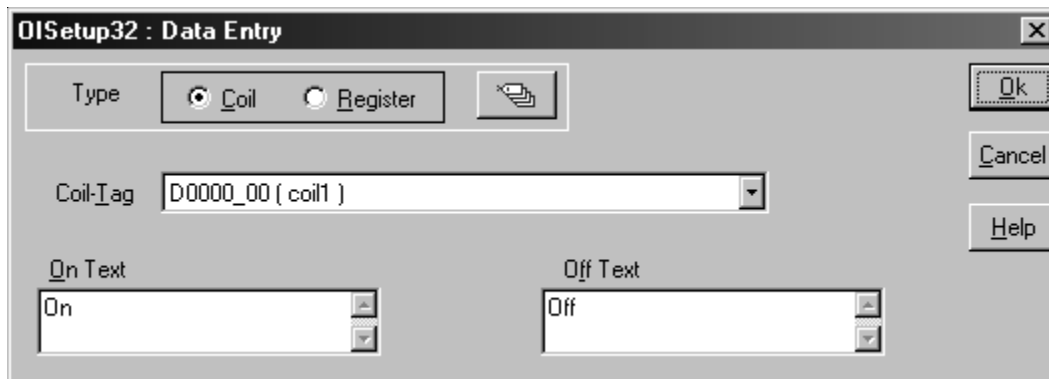
Plain Text: Select Text Tool [T]. Select font size 7x14. Place tool on the screen. Type the characters.

```
┌─────────────────────────────────────────┐
│ ▦ Screen [ 1 : Screen1 ]              ☒ │
├─────────────────────────────────────────┤
│            │OIS 60 Demo Application│     │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
│                                          │
└─────────────────────────────────────────┘
```

Data entry:

1. Coil Data Entry: Select Data Entry Tool [▦]. Select Coil 'Coil 1'. Enter On text as 'On'. Enter Off text as 'Off'. Click 'OK'

```
┌──────────────────────────────────────────────────────────┐
│ OISetup32 : Data Entry                                 ☒ │
├──────────────────────────────────────────────────────────┤
│                                                           │
│   Type    ⦿ Coil   ○ Register    [🖰]          ┌─────┐   │
│                                                 │ Ok  │   │
│                                                 └─────┘   │
│                                                 ┌───────┐ │
│  Coil-Tag  [D0000_00 ( coil1 )            ▼]    │Cancel │ │
│                                                 └───────┘ │
│                                                 ┌───────┐ │
│   On Text                    Off Text           │ Help  │ │
│  [On              ▲]        [Off           ▲]   └───────┘ │
│  [               ▼]         [              ▼]             │
│                                                           │
└──────────────────────────────────────────────────────────┘
```

2. Register Data Entry: Select Tag 'D0001'. Set Low Limit as 10000. Set High Limit as 20000. Click 'OK'

OISetup32 : Data Entry

| Type | ○ Coil   ⊙ Register | | Ok |

Register-Tag D0001 (d0001)

Data Type Unsigned integer   Format #####

Low-limit   10000   0 <= Low <= High

High-limit   20000   65535

1st-operation NOF + − * /   [-2147483648 to 2147483647]

2nd-operation NOF + − * /   [-2147483648 to 2147483647]

Cancel

Help

Applications Examples

Bit Lamp: Select Bitmap Lamp Tool ⌖ . Place it at proper location. Select Lamp Style and size. From Operation Page, select the Tag as 'Coil 1'.
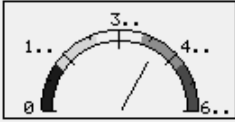
Analog Meter: Select Bitmap Lamp Tool [icon]. Place it at proper location. From Operation page, select Tag as D0001. Set Display Range as 0 to 65535. Set End tag value as 60000.
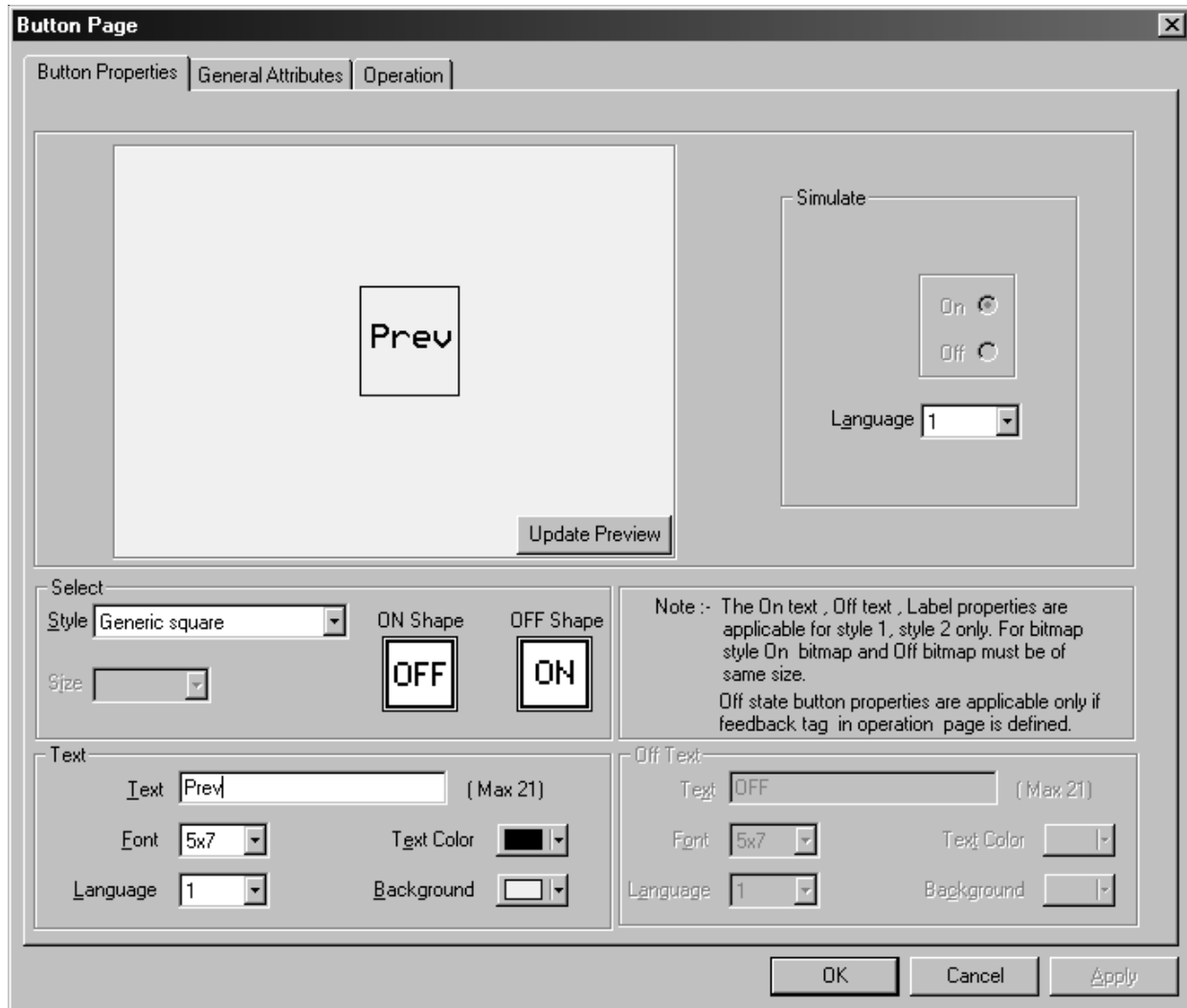
Applications Examples

Bit Buttons: Select Bit Button Tool ▢ . Place on the screen. Buttons will be used to Acknowledge alarm, View Next alarm, Previous alarm, Clear Alarm Tag value. Select appropriate tasks fro Operation page for the button. Edit button text according to the task.

Alarm Object: Select Alarms Object Tool [icon] . Add the Number field. Set Alarm text length as 10. Click
'OK' to accept object.

6.4   Define Alarms

Alarm will be displayed in the alarm window only if it is defined from the '***Define Alarm***' menu. Close

screen window. Click [bell icon] tool. Select tag as D0001. Add 'Alarm 0' text for 'Bit 0'. Add 'Alarm 1'

text for 'Bit 1'. Select print option to enable printing for any particular alarm. Click 'OK' to accept the
alarm options.

6.5   Define ApplicationTasks

After user has completed defining all the screens, he must select the screen to be displayed after power up. User can also define some tasks which need to be done only after power-up. After a new application is created in OISetup32 Software, default power-on task is defined to be 'Goto Screen of number: 00001'. If user wants to display a different screen, he must change this number after defining all the screens.
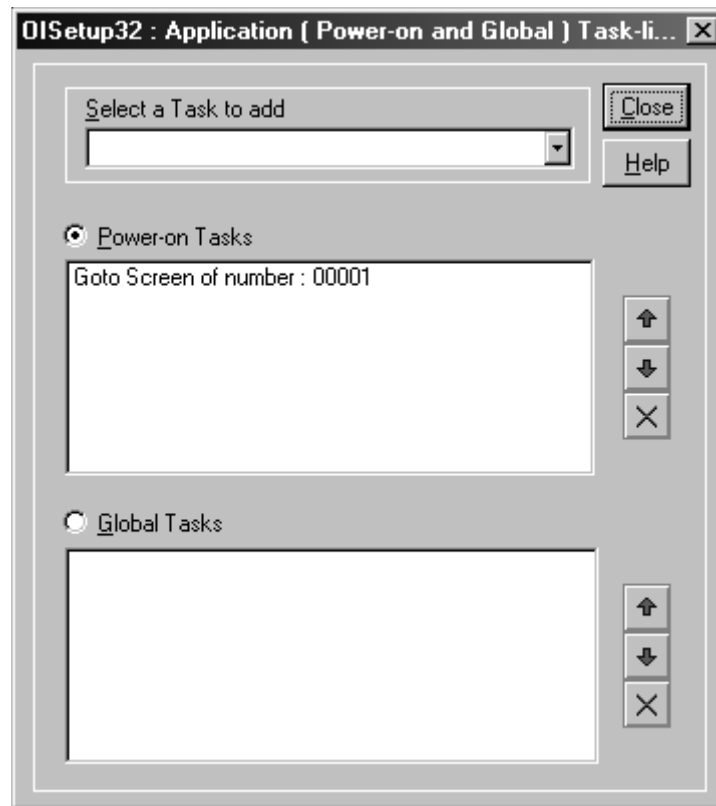
If user wants to control the screen display from the PLC, he must define a task 'Copy tag to STR' in Global task list. Now screens will be displayed depending on the value in the defined tag. Screens can also be changed from the touch key or conditional tasks in screen task list. Global task list need not include any 'Goto..' or 'Copy tag to STR..' task.

6.6   Load Applications into OIS60

Click [floppy disk icon] to save this application.

```
┌─────────────────────────────────────────────────────────┐
│ Save OISetup32 Application                        ? ✕ │
│                                                            │
│ Save in:  📁 Result          ▼  🔼  📝  📑  ▦  ▤         │
│                                                            │
│  ▧ demo_OIS60.pzm                                          │
│  ▧ OIS40R Self test.pzm                                    │
│  ▧ OIS40RSample.pzm                                        │
│  ▧ ois60.pzm                                               │
│                                                            │
│                                                            │
│ File name:     *.pzm                              Save   │
│                                                            │
│ Save as type:  OISetup32 Applications(*.pzm)  ▼   Cancel │
└─────────────────────────────────────────────────────────┘
```
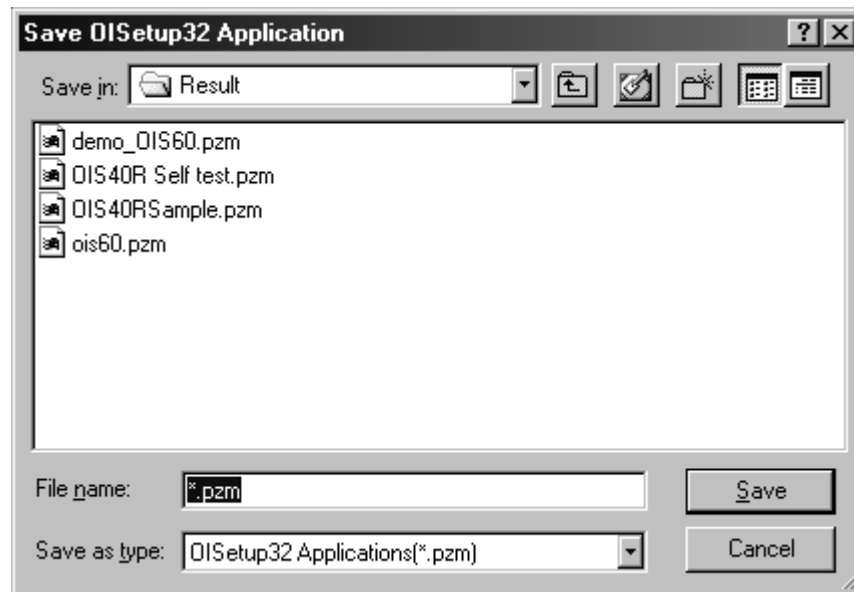
Click [computer download icon] to download application in OIS60. Select Application from the download window

presented. Click 'OK' to start Download.

```
┌─────────────────────────────────────────────────────────┐
│ Downloading from Computer to OIS                      ✕ │
│                                                            │
│ Communication Port │ COM1 │      ○ Firmware  ◉ Application │
│ ┌──────────────────────────────────────────────────────┐ │
│ │                                                        │ │
│ │    [computer graphic]────────────[OIS panel graphic]  │ │
│ │                                                        │ │
│ └──────────────────────────────────────────────────────┘ │
│ ┌──────────────────────────────────────────────────────┐ │
│ │          The unit may contain data in it's memory.     │ │
│ │ The DOWNLOAD operation will overwrite the memory. This │ │
│ │             operation is NOT REVERSIBLE.               │ │
│ │ If you are sure to download press 'Ok' otherwise press │ │
│ │                      'Close'.                          │ │
│ └──────────────────────────────────────────────────────┘ │
│                          Ok    Close    Help             │
└─────────────────────────────────────────────────────────┘
```
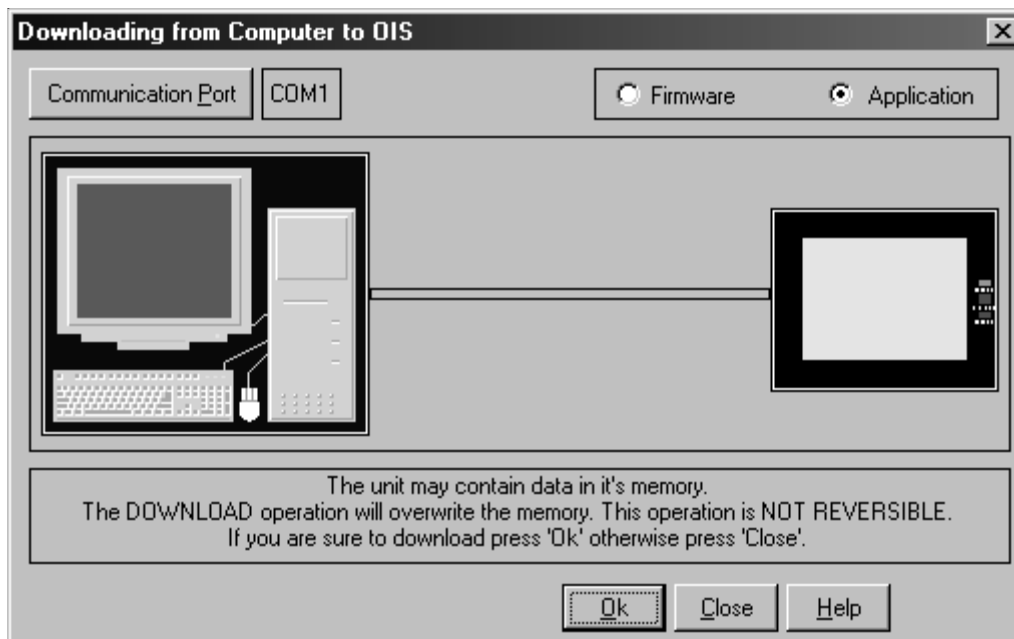
7. FREQUENTLY ASKED QUESTIONS

In this Chapter

> **How Do I ?**

7.1   How Do I ?

This chapter answers the questions users often times ask.

1.   How do I read PLC data?
To read any PLC data, the required tag should be defined in the **Tag Database**. In a screen the tag should be embedded in the required format.

2.   Can I edit PLC data? How?
Any PLC register / coil can be edited except for 'Read only' registers / coils. Generally System registers and Input coils are 'Read only'. 'Read only' registers / coils vary from PLC to PLC. Please refer to PLC manual for details. To edit any PLC data define the tag in Tag Database. Place a 'Data Entry' object in a screen. Make sure to define the required keys. Register and Coil data entry key definitions are given in Table 4.2 and Table 4.3.

3.   Can I keep a record of the Process data?
OIS60 model can send screen data (Alphanumeric data only) on its serial port. This output can be given to a serial printer and a record of events can be achieved. A screen with 'Print Data' task can print all the alphanumeric objects.

4.   Can I change screens using PLC logic?
Any PLC tag can be copied to STR, a system register internal to OIS, and OIS will display the corresponding screen. User must define the task 'Copy tag to STR' in Global Application Task-List. Make sure to define screens to all the possible values of the tag to avoid 'Screen not defined' message. Please note that the 'Goto screen', 'Goto next screen' and 'Goto previous screen' tasks will not work in this case. To change the screen the value of the PLC data should be changed.

5.   Can I perform any task continuously?
To perform any task, continuously define the task in Global Application Task-List. This task will be performed till the unit is powered down.

6.   How can I 'Hold' any Bit on or off using a key?
To hold a bit on using a key, define 'Turn bit on' task in 'Key press task-list' and 'Turn bit off' task in 'Release key task-list' for the same key.

7.   How do I keep any screen or any key locked?
Any screen or a key can be kept secret using the 'Password' feature of OIS60. Password protected screen will not be displayed till the user enters the correct password. Similarly task for password protected key will not be performed till user enters the correct password

8.   Can I assign scaling factor for any tag?
Value of any tag can be converted in to the required format by performing 'Math Operations' on it. This DOES not change the value of the actual tag. 'Math Operations' can be performed in 'Display OIS / PLC Data' objects. Data to be written to a tag can also be manipulated by assigning 'Math Operations' in 'Data Entry' object.

9.   Can I limit the data to be entered in a tag?
Data entered in any register tag can have high and low limits. This keeps a check on the register limits.

Refer to 'Configuration software' section for detailed information on how to define an application

8. DIAGNOSTICS AND MAINTENANCE

In this Chapter

- ➢ **Diagnostics**
- ➢ **Maintenance**

8.1 Diagnostics

8.1.1 OIS60 Self Test Application

OISetup32 Software has a self test application for OIS60. This application tests:
- Touch Screen
- LCD
- RTC
- PLC Port

Setup Requires for this test is:
1. OIS60
2. Toshiba T1 PLC (Programmed for Running Timer T0)
3. OIS to Toshiba T1 PLC Programming port cable (Part code no. EC-P-019A-00)
4. OIS to Toshiba T1 PLC RS485 port cable (Part code no. EC-P-046A-00)
4. OIS Programming Cable (Part code no. 26-117B)
5. OISetup32 Software (Version 1.1A or higher)

Testing Instructions:
1. Open OIS60_SELF_TEST.PZM application from OISetu32 Software. Download firmware and application. Connect EC-P-019A-00 cable between unit and T1 PLC.

2. After unit is powered on, 'RUN' and 'POWER' turn on.

3. Unit will display first Screen. Screen 1 displays three squares, one blue, one red and one green, on the screen. This ensures that the LCD is functioning properly.

4. After a delay of 2 seconds the screen will change to test Touch Screen.

5. Press Blue Touch key in top right corner to continuously increment tag. If pressed inside a valid boundary, single beep results. It indicate active touch area.

6. Use Numeric keypad to enter Hexadecimal data.

7. Press 'NEXT' to go to next screen.

8. Screen 3 tests PLC port of the unit. When PLC communication starts, 'COMM' LED on the overlay blinks.

9. Timer T0 is embedded. Output coil 0 (Y0_0) and Data memory Tag (D150) are ediatble tags. Keys are defined as:
   CLR: To clear Data entered
   ESC: To Esape data entry
   SHIFT: To shift value ti left by one digit.
   INCR: To increment digit at units position.
   ENTER: To accept data entered.

10. To test RS485 port of the unit, open OIS60_RS485_TEST.PZM. Download firmware and application in the unit. Connect EC-P-046A-00 cable between unit and T1 PLC.

11. Screen 1 tests the PLC communication on RS485 port of the unit.

If the OIS has executed the Self Test program(s) successfully and the user is still experiencing problems, these problems are probably software related and not hardware problems. Please check:
   The OIS program
   The PLC ladder program.

8.1.2   Touch Screen Calibration Loss:

Touch screens are factory calibrated. Calibration is stored in an EEPROM. If user faces any of the following problems:

- Any press inside defined object boundary results in three short beeps.
- Undefined area performs a task of some other defined object.

User will have to calibrate the touch screen of the unit. Steps for calibrating the touch screen for OIS60 are as bellow:-

1.   At power ON, press the center of the OIS60 screen for more than 7 to 8 seconds.
2.   Press the top left corner of the screen. The unit will now go into Touch screen calibration mode. A cross is shown at the bottom left with a message "Touch here with stylus".
3.   Touch the center of the cross with a pointed object (stylus recommended). You will get a next screen showing a cross at the top right of the screen with a message "Touch here with stylus".
4.   Touch the center of the cross with a pointed object (stylus recommended). The screen has now been calibrated and will return to its normal mode.

8.2   Maintenance

8.2.1. Clean all sides of the unit using a isopropyl alcohol solution. Use a clean, soft piece of cloth. Do not use a rough cloth as it may produce scratches on the unit. Take proper care while cleaning the keypad of the unit, especially the LCD window. Also take care that the LCD window does not come in contact with the material that has an abrasive surface.

8.2.2. Do not use benzene, paint thinner or other volatile solvents. Do not use any chemically treated cloth, wipes, or rags.
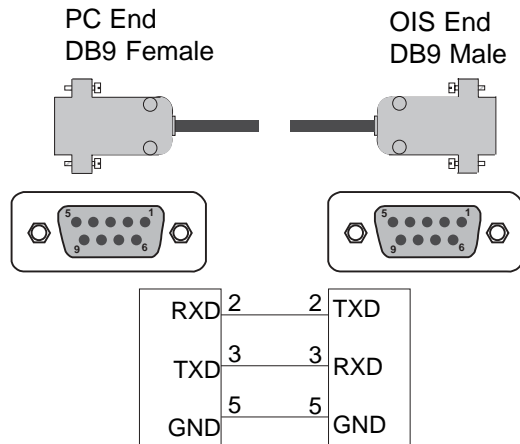
APPENDIX

In this Chapter

- ➢ **Cable Diagrams**
- ➢ **Order Numbers for Model and Cables**

A   Cable Diagrams

Pin Configuration for Programming Cable for OIS60:

PC End
DB9 Female

OIS End
DB9 Male

RXD	2	2	TXD
TXD	3	3	RXD
GND	5	5	GND

Pin Configuration for EC-P-019A-00

PLC End
8 Pin MINIDIN

OIS End
DB9 Male

TXD	6	3	RXD
RXD	8	2	TXD
GND & SHIELD	5	5 & 9	GND & SHIELD

Short pin 4 & 7 at PLC end

Pin Configuration for EC-P-019B-00

PLC End
DB9 Male

OIS End
DB9 Male

TXD	3	3	RXD
RXD	2	2	TXD
GND & SHIELD	5	5 & 9	GND & SHIELD

Short pin 7 & 8 at PLC end

Pin Configuration for EC-P-046A-00

PLC End

OIS End
DB9 Male

RXA (Yellow)	1	TX+
TXA (Green)	4	RX+
RXB (White)	8	TX-
TXB (Blue)	9	RX-
GND (Black & Shield)	5	GND
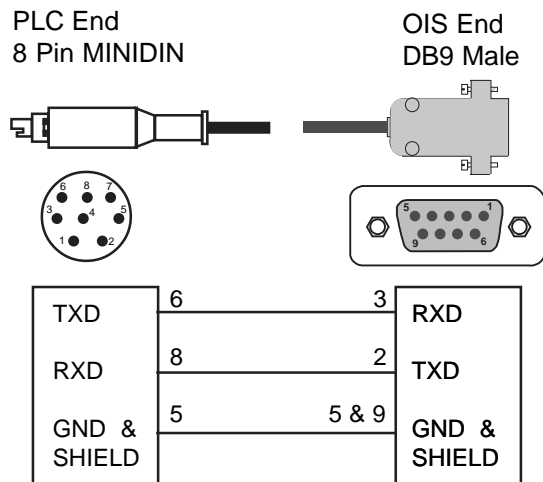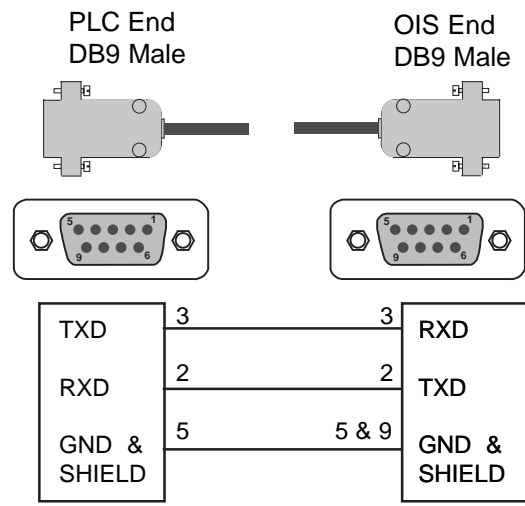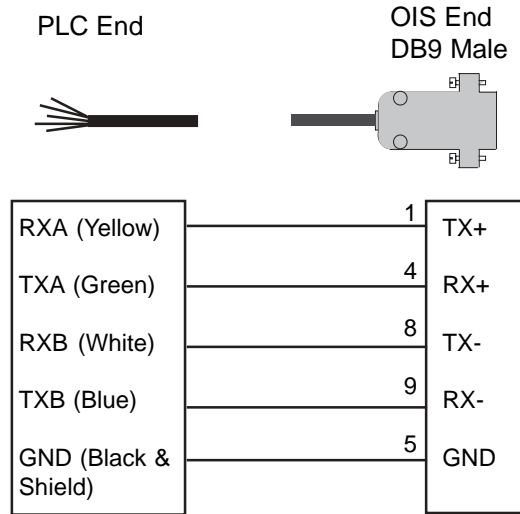
RX+ is also known as RXA

Pin Configuration for EC-P-046B-00

PLC End
DB15 Male

OIS End
DB9 Male

RX+	2	1	TX+
TX+	3	4	RX+
GND	7	5	GND
RX-	10	8	TX-
TX-	11	9	RX-
GND	1		GND & SHIELD
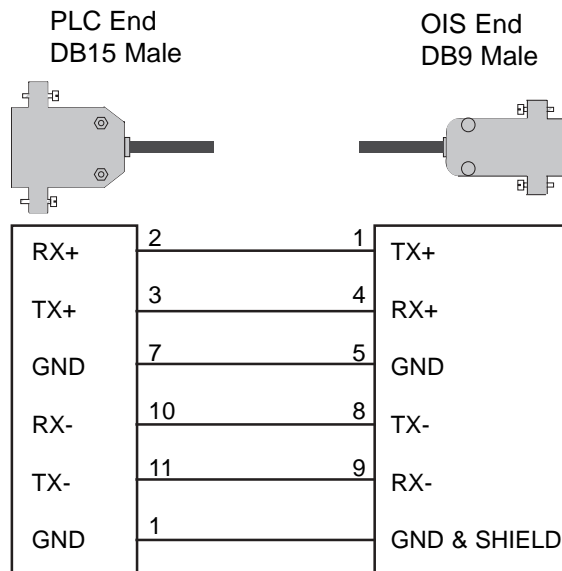
Short pin 4 & 5 at PLC end
Short pin 12 & 13 at PLC end

Pin Configuration for EC-P-050-00

PLC End
8P8C Connector

OIS End
DB9 Male

RXD	3	7	CMOS TXD
CMOS TXD	5	3	RXD
GND	2	5	GND
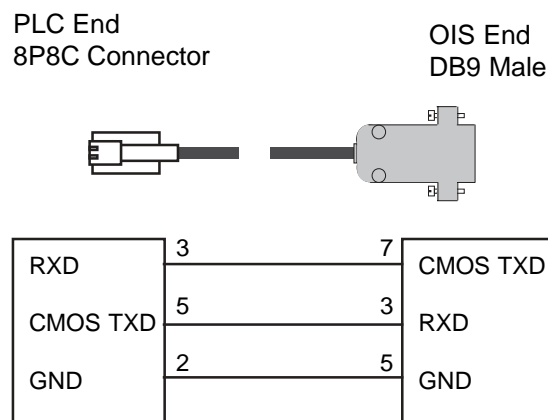
B   **Order Numbers for OIS, Converters & Cables**

This section lists the model number and suitable cables.

	<u>Part Numbers</u>	<u>Description</u>

Model

OIS60   Operator Interface Station

Cables for OIS60:

EC-P-019A-00   Cable connects to T1 programing port, (2 meter)
EC-P-019B-00   Cable connects to T2 programing port, (2 meter)
EC-P-046A-00   Cable connects to T1 / T2E RS485 port, (2 meter)
EC-P-046B-00   Cable connects to T2N RS485 port (DB15 Connector), (2 meter)
EC-P-050-00   Cable connects to VF S7_nC1 port, (2 meter)

Programing cable common for OIS60:

26-117B   **RdioShack** RS232 Programming Cable (or equivalent), 9 pin D shell (male & female), order directly from RdioShack.

TOSHIBA

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