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 OIS40R Product.

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

<u>**Warnings used in this manual**</u>**:**

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 OIS40R**
Document: **UMAN\OIS40R\0103**
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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<u>Introduction</u>

In this chapter. . . .

1.1 Purpose of this Manual

The intention of this Operation Manual is to provide a guide for Safe installation, Configuration and operation of OIS40R. This manual is applicable for OIS series models.

Read this operation manual thoroughly before installing and operating OIS40R.

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 hardwares. Toshiba Houstan reserves the right to update information in this publication without prior notice.

1.2 Introduction to OIS40R

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

Configuration of OIS:
Each OIS has to be configured using the OISetup Software before connecting it to the PLC.

OIS-IBM Cable
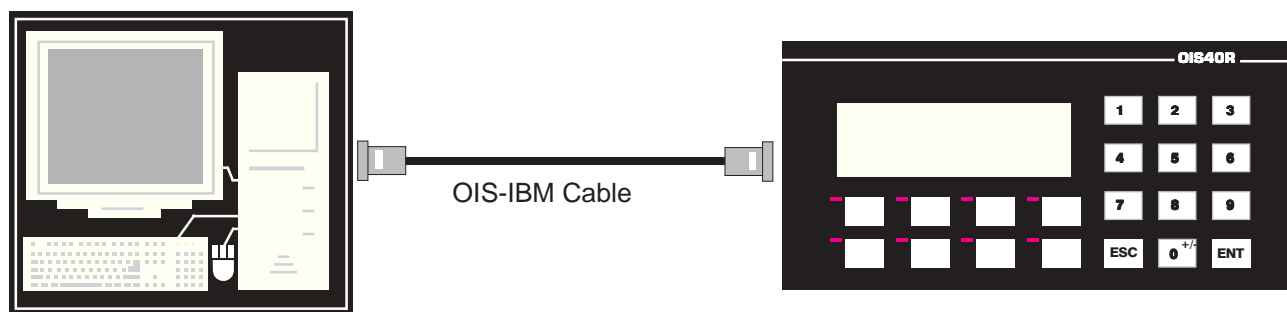
Normal Operation:
Connect Prizm to PLC using the correct PLC-Prizm cable and your Prizm is running.

485 Port of unit

PLC

To PLC
Programming Port

UNIT

Connecting
Cable

Smart cable Box
(if necessary)

OIS40R: SPECIFICATIONS

Specifications:

Power: 24VDC $\pm$ 10%, 2 W maximum
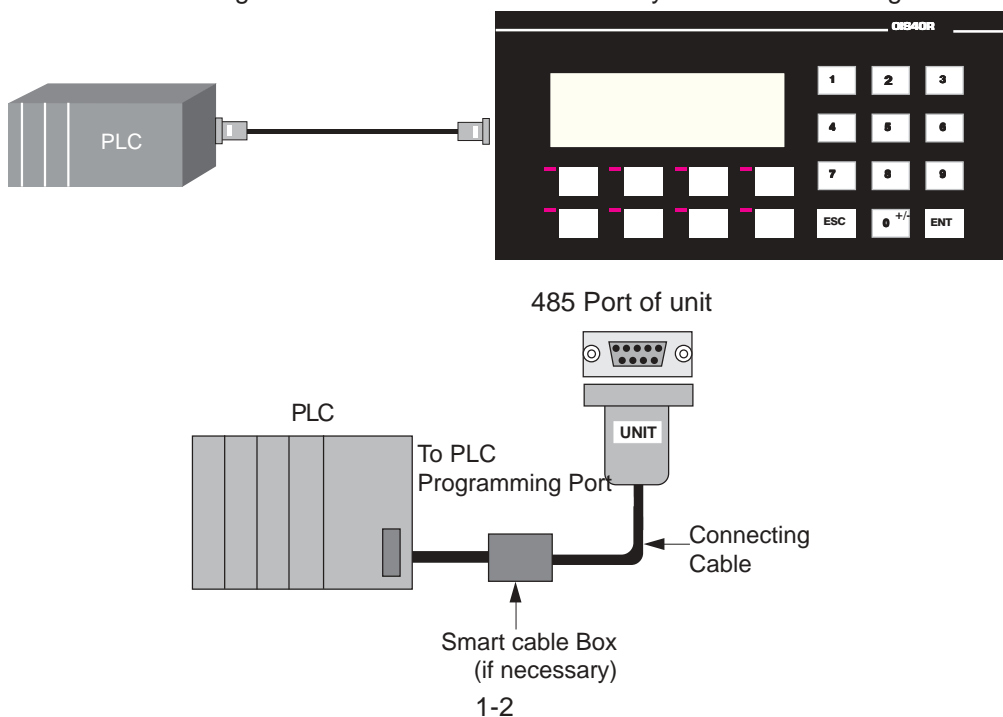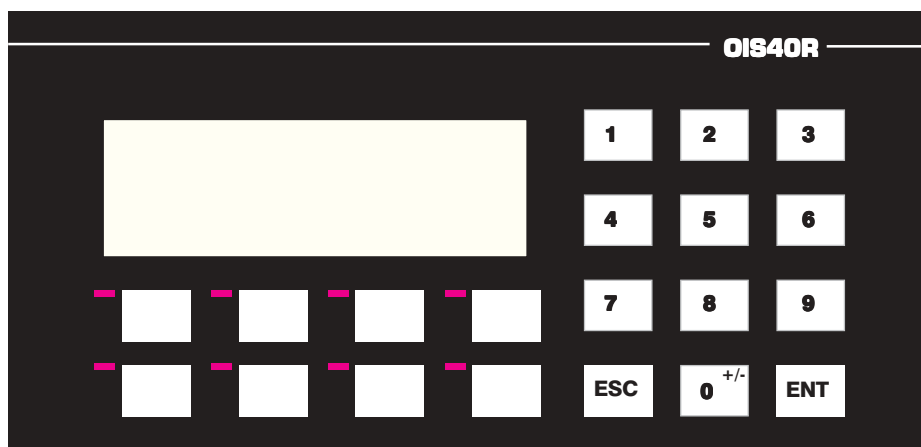Display: 4 lines of 20 characters Backlit LCD
Bezel: IP 65 rated Keypad
LEDs: 8 LEDs
Keys: 20 User definable keys with tactile feedback
Memory: 24K Application Memory
Communication: One 485 port and one serial port for programming / printing.
Temperature: 0 to 50 ºC
Humidity: 10% to 90% (Non condensing)
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:

- OIS40R unit with LCD display and Membrane keypad
- Power Supply connector.
- Insertable Legends
- Installation Kit: Gasket, Two Mounting clamps, Two M4 screws, Four hex nuts, and Two mounting inserts.
- OISetup Software Installer.

Note: User should order PLC / IBM cable separately.

<u>Hardware</u>

In This Chapter. . .

This chapter is installation guide for OIS40R unit. This includes OIS40R unit, which is 24VDC powered.

2.1 Installation Instructions

OIS40R should be mounted on a panel. Gasket, mounting screws with inserts and clamps are provided with each OIS40R unit for proper mounting.

Environmental Considerations:
Make sure that the unit is installed correctly and that the operating limits are followed (see Specifications for OIS40R).

Do not operate OIS40R in areas subject to explosion hazards due to flammable gases, vapors or dusts.

OIS40R 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 equipments 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 OIS40R.

Particular note should be taken to the position of Variable speed drives and switching power supplies.

Insertable Legends and Panel Mounting

OIS40R supports user definable legends for some of its function keys. Legends can either be text strings or bitmaps of the required size. The size of the key the, distance between two keys is given below. The insert should be cut on the dotted line. It should be inserted in the slot provided behind the bezel. Now OIS40R unit is ready to be mounted on a panel.

For OIS40R Insertable legends specifications are as below:

|		
Key Width	:	12mm
Key Height	:	9mm
Distance between keys	:	8mm and 19mm
Insert Width	:	13mm
Insert Height	:	40mm
Insert Direction	:	From Bottom

Dimensional sketch and Panel cutout for OIS40R model is given in this section. Also given is an illustration for insertsble legends for this supported model.

Dimensional Sketches and Panel Cutouts
This section presents the dimensional sketches and panel cutouts for OIS40R model.
All dimensions are in mm. Not to Scale.
**Panel cutout: 162.00 mm x 79.00 mm**
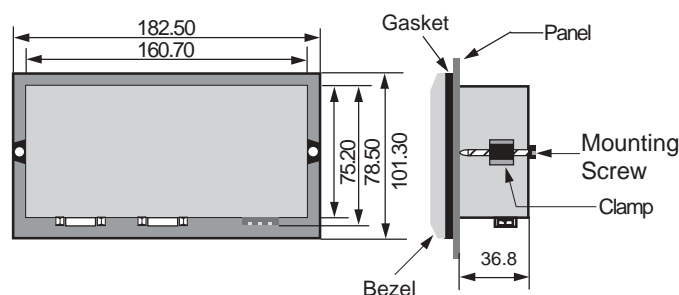
Follow the procedure given below for proper mounting:
1)   Make a cutout of the required size. Panel cutout tolerance is $\pm$ 0.1mm.
2)   Insert the insertable legend in the slot provided on back side of bezel.
3)   Put the gasket behind the bezel (see dimensional sketch for details). The gasket may be sealed to the case using an adhesive.
4)   Put the OIS40R unit through the panel cutout.
5)   Insert the clamps into the case.
6)   Pullback the clips until they seat into the retaining slots.
7)   Tighten the clamping screws in an even pattern until the OIS40R unit is secured into the panel.

Additional 2" clearance should be allowed for cables connections

Procedure to insert Legends and mount on a Panel for OIS40R model:
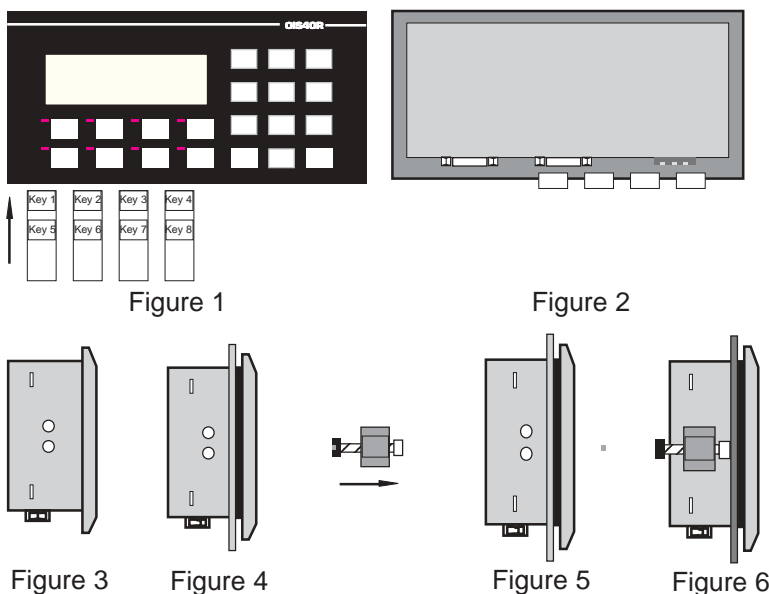
Figure 1:   Inserts should be inserted into the slot provided on back side of the bezel.
FIgure 2:   Back View of the unit after insert is inserted.
FIgure 3:   Side View of the unit after insert is inserted.
FIgure 4:   Cut the excess portion of the insert leaving only small edge to pull the insert out.
             This will be required if insert needs to be changed.
Figure 5:   Slide the mounting clamp along with the hex nuts and mounting screws in the mounting hole.
Figure 6:   Tighten the screws till the unit is secured in the panel.

2.2 Power Requirements

As said earlier, OIS40R model take power from external power supply source. Specified supply voltage for the unit models is +24VDC $\pm$ 10%.

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 NON-HAZARDOUS 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 NON-HAZARDOUS."*

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

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.

OIS40R 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 unit 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.

OIS40R unit has two ports - a 485 Port and a Serial Port. Description of each is given in the following topics.
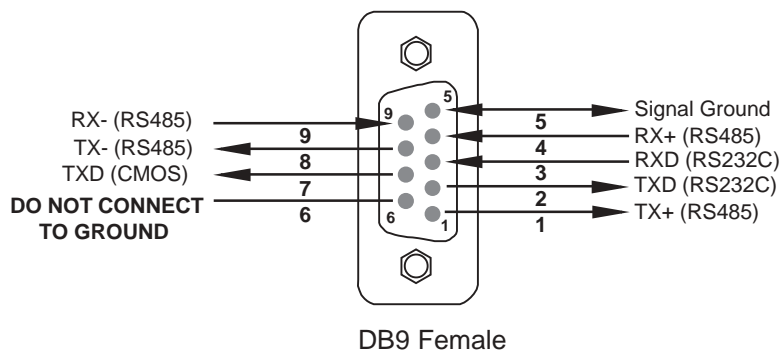
2.3 Serial Port

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 Prizm is communicating with a PC for programming, PLC operations are suspended. Pin description of the Serial Port as seen on the OIS40R unit is given below:

5 → Signal Ground
3 → RXD (RS232C)
2 → TXD (RS232C)

DB9 Female
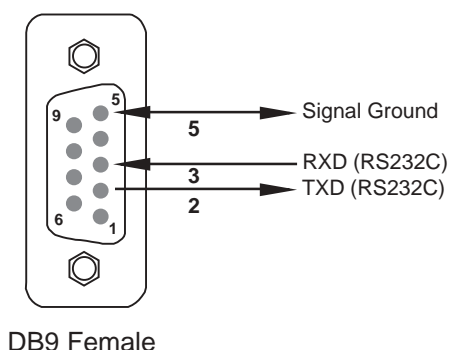
2.4 PLC Port

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 OIS40R model is as given below:

RX- (RS485) — **9**
TX- (RS485) — **8**
TXD (CMOS) — **7**
DO NOT CONNECT TO GROUND — **6**

5 → Signal Ground
4 → RX+ (RS485)
3 → RXD (RS232C)
2 → TXD (RS232C)
1 → TX+ (RS485)

DB9 Female

<u>Getting Started</u>

In this chapter....

3.1 Introduction

OIS40R is an Operator Interface for PLCs. It communicates with a PLC over its serial 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, OIS40R can also change the values of PLC registers / coils.

3.2 Application - Tags, Screens, Keys and Tasks

Microsoft Windows® based configuration software, OISetup 32, helps user to configure OIS40R unit. 'Configuration' means making the OIS40R unit work as per the system requirements, Eg. OIS40R 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 OISetup 32. Any coil or register to be used in the application is known as Tag and must be first defined in the Tag data base.

The LCD display on OIS40R 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 keys. Different tasks can be assigned to keys on the OIS40R 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. OIS40R can now communicate with a PLC.

3.3 PLC communication

OIS40R can communicate with any PLC without any change in the OIS40R hardware. To communicate with a PLC, OIS40R unit needs:
1. Proper Communication Driver for the PLC
2. OIS40R - 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 OIS40R unit alongwith the **firmware**. Communication driver varies from   PLC to PLC. This driver enables unit to talk to a PLC.

2. OIS40R - PLC Communication Cable:
   Proper OIS40R - PLC cable is required for error free communication with any PLC.

Understanding OIS40R Features

➢   In this Chapter...

This chapter explains in detail all the features of OIS40R unit. We recommend that you study this chapter before attempting to configure and use the OIS40R.

4.1 Screens

Operator can view required information on the LCD display of OIS40R 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 five properties.

Properties of Screen:

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.

2. Associated Screens:
    Associated screen can be specially 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 associate 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*
    - *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.*

3. Screen Keys or Local Keys:
    OIS40R keys have two types of definitions: Global and Local.
    1.   Global Definitions: Definitions remain same for all the screens.
    2.   Local Definitions: These definitions can vary with screens. These definitions have priority over Global definitions.
    Please note that for a particular screen, a key can have local and global definitions, local definition has priority over global and the global definition task is not performed in this case.

    Any task can also be performed by pressing two keys simultaneously. The definition can be either local or global. The double keys function can be very useful in OIS40R model with lesser number of keys.

4. 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 ScreenTasks:
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

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 OIS40R 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 OIS40R 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.
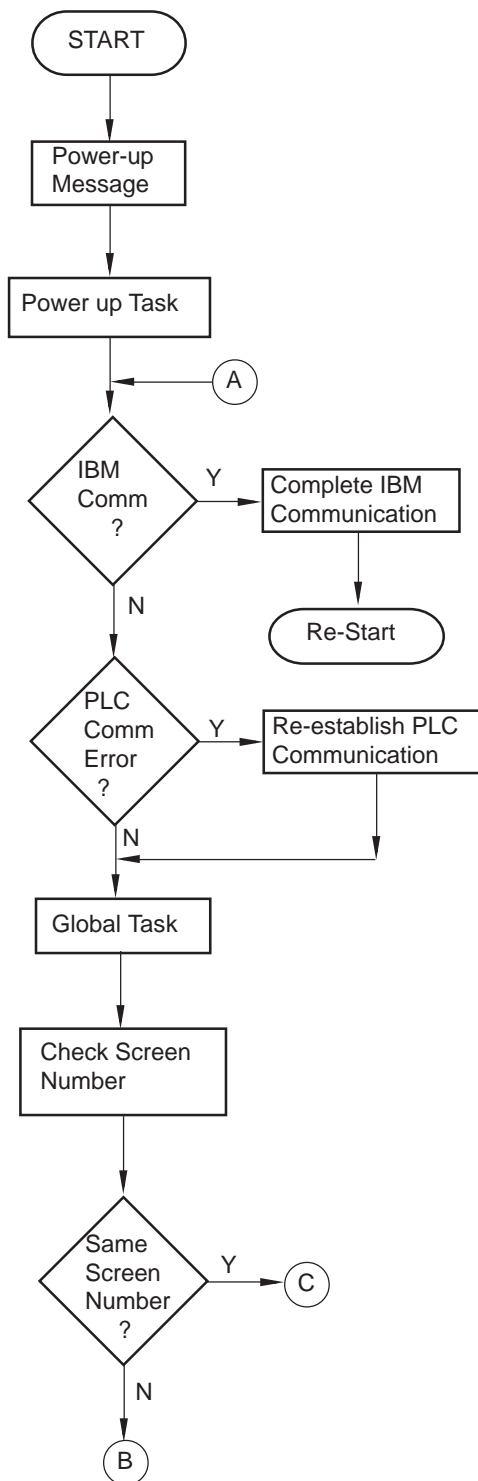
TOSHIBA
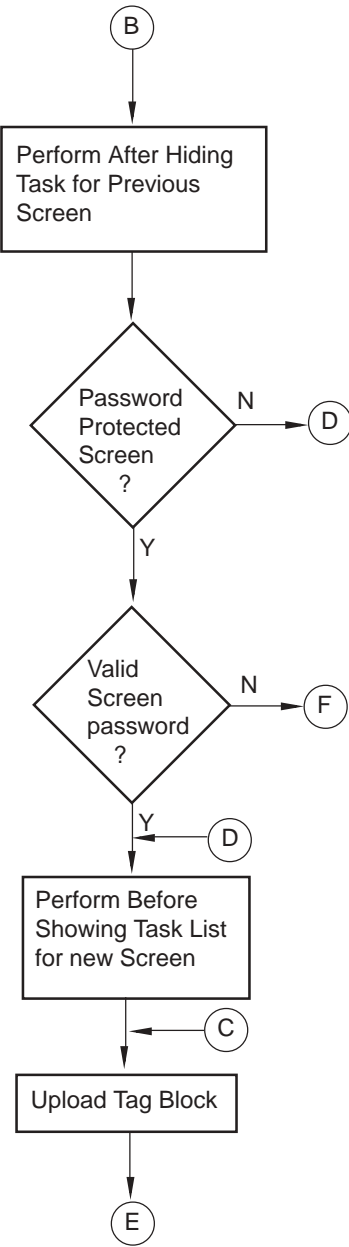
5. Screen Type:
   A screen can be a Print-only screen, Display or both
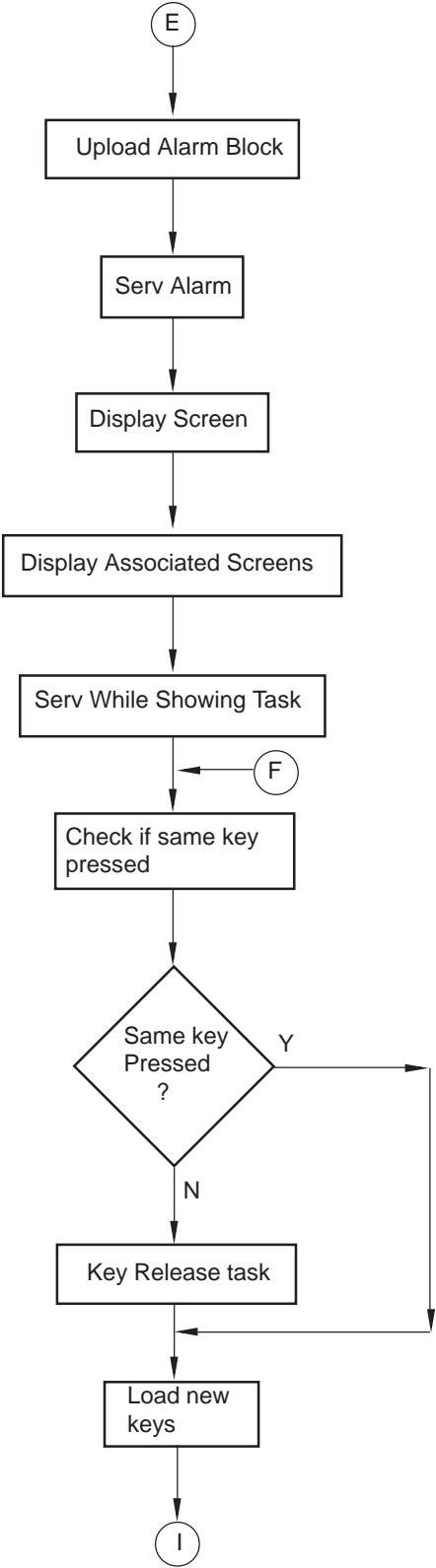   - Print-only
     The screen will be printed as soon as it is triggered. The screen will not be displayed
   - Display
     The screen will be displayed on the display.
   - Both
     The screen can be printed as well as displayed. The screen will be printed as soon as it is triggered.
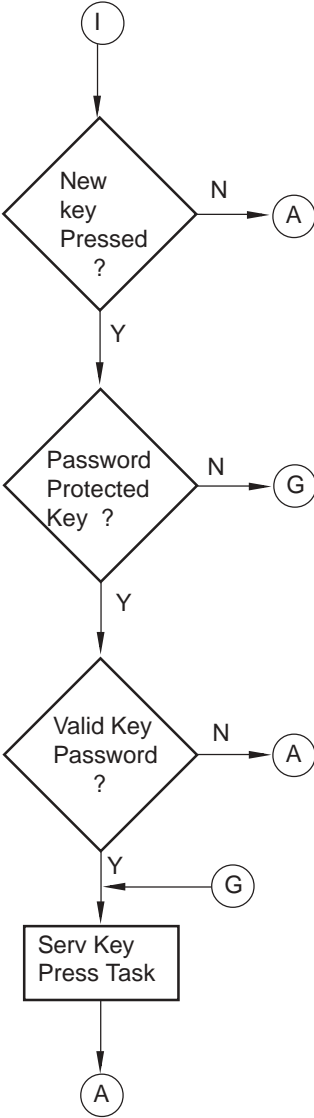
How OIS40R works?

The OIS40R model follow a particular 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
                       ▼
                     ( B )
```

4-6

```
        ( B )
          │
          ▼
┌──────────────────┐
│ Perform After Hiding │
│ Task for Previous    │
│ Screen               │
└──────────────────┘
          │
          ▼
        ╱ Password ╲        N
       ╱  Protected  ╲──────────▶ ( D )
       ╲   Screen    ╱
        ╲    ?     ╱
          │ Y
          ▼
        ╱  Valid   ╲         N
       ╱   Screen   ╲──────────▶ ( F )
       ╲  password  ╱
        ╲    ?     ╱
          │ Y        ( D )
          ▼
┌──────────────────┐
│ Perform Before   │
│ Showing Task List│
│ for new Screen   │
└──────────────────┘
          │        ( C )
          ▼
┌──────────────────┐
│ Upload Tag Block │
└──────────────────┘
          │
          ▼
        ( E )
```

E

Upload Alarm Block

Serv Alarm

Display Screen

Display Associated Screens

Serv While Showing Task

F

Check if same key pressed

Same key Pressed ?

Y

N

Key Release task

Load new keys

I

```
                    ( I )
                      │
                      ▼
                  ╱       ╲
                 ╱   New   ╲        N
                ╱    key     ╲──────────▶ ( A )
                ╲  Pressed   ╱
                 ╲    ?    ╱
                  ╲       ╱
                      │
                      │ Y
                      ▼
                  ╱       ╲
                 ╱Password  ╲       N
                ╱Protected   ╲──────────▶ ( G )
                ╲  Key  ?    ╱
                 ╲         ╱
                  ╲       ╱
                      │
                      │ Y
                      ▼
                  ╱       ╲
                 ╱ Valid Key╲      N
                ╱ Password   ╲──────────▶ ( A )
                ╲     ?      ╱
                 ╲         ╱
                  ╲       ╱
                      │
                      │ Y       ( G )
                      ▼  ◀────────
              ┌──────────────┐
              │  Serv Key    │
              │  Press Task  │
              └──────────────┘
                      │
                      ▼
                    ( A )
```

Screen Objects and Animation Properties:

OIS40R has alpha-numeric objects displayed on the screen which have Animation properties. Animation Property is a conditional property of an object which changes with the value of the Tag associated with it. Animation properties are of three types: Show / Hide, Flashing.

1. Show / Hide Animation: Object is displayed only when the condition specified by the user is true.
2. Flashing Animation: An object is flashed when the condition becomes true. Exception Data Entry objects.

Screen Objects

Screen objects are text objects. Alpha-Numeric Objects have certain properties, referred as 'Attributes'. Attributes are useful for suggesting the importance of the particular text object. Attributes for OIS40R model are:
-    Flash
     User can assign flashing to any text object*. An object can flash at three different speeds:
     Slow, Medium and Fast. By default no object is assigned flashing attribute. If flashing is defined, slow flashing is selected by default. *Data Entry objects (Coil and Register) do not have flash attribute.*

Alpha-Numeric Objects can be further divided into:
1.   Plain Text
2.   Coil Data Entry
3.   Register Data Entry
4.   Display Coil Data
5.   Display Register Data
6.   Register Text
7.   Time
8.   Date
9.   Alarms

1. Plain Text:
   Plain text object is useful for displaying any message for the operator. Plain Text Objects do not depend on the PLC. In case of OIS40R model, even if the PLC is not connected, this object will be displayed.

2. Data Entry Objects:
   Any register or coil from the PLC Memory, except Read-only registers and coils, can be edited using the OIS40R keypad.

   Coil Data Entry:
       Procedure to edit a coil is as follows:
       1. Press a key with definition 'Accept Data Entry' 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 key with definition 'Accept Data Entry' to accept the data entered.

   Default coil data entry keys are "ENT", "0" and "1".

Register Data Entry:

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 defini tion 'Cancel Data Entry' cancels the data entered and exits data entry mode.
2. In OIS40R keypad, press key with definition 'Sign (+/-) and 0' to enter negative sign. Sign will be automati cally 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 software. In OIS40R default keys for register data entry are "ENT", "ESC" and the numeric keys from "0" through "9".

3. Display Bit Text:
   This object displays text depending on the bit status. Bit on and Bit off text is defined by the user while writing the application.

4. Display Register Value:
   This object displays the value of a register.

5. Display Register Text:
   This object displays text depending value of a register. Text is defined by the user while writing the application.

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

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

8. Alarms:
   This object displays the alarm text when the alarm occurs. First triggered alarm is on top. Alarm condition for alarm should be cleared. Each alarm has to be acknowledged. 'Acknowledge Alarm' key acknowledges the alarm. The alarm text is cleared when the alarm condition is cleared and the alarm is acknowledged.

4.2 Keys

Keys are needed whenever the operator has to modify some PLC data, acknowledge an alarm or take a control action. OIS40R keypad has the ability to perform the above mentioned as well as many more tasks. User can define the task to be performed by each key.

Key Tasks are divided into following types depending upon the type of key closure:
- Key Press Tasks
  These tasks are performed at the instance of key closure.
- Key Pressed Tasks
  These tasks are performed while a key is pressed and held down.
- Key Release Tasks
  These tasks are performed when a key is released.

Types of 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. Set RTC
16. Copy Tag to STR
17. Copy Tag to LED
18. Delay
19. Wait
20. Copy Recipe Block to PLC Block
21. Copy PLC Block to Recipe Block
22. Key Specific 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.* 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 bit can be toggled using this task. The bit / coil will be toggled each time the key is pressed.

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. Set RTC:
     This task allows user to set RTC at runtime. After the key is pressed, the corresponding parameter will be incremented by 1.

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

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

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

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

20. **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.

21. **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.

22. **Keys Specific Tasks:**
    Apart from the above mentioned tasks each key can be assigned a task which can be common to all the tags.

Types of key 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
      Enters a '0' after data entry is initiated.
   15. Numeric Key 1
      Enters a '1' after data entry is initiated.
   16. Numeric Key 2
      Enters a '2' after data entry is initiated.
   17. Numeric Key 3
      Enters a '3' after data entry is initiated.
   18. Numeric Key 4
      Enters a '4' after data entry is initiated.
   19. Numeric Key 5
      Enters a '5' after data entry is initiated.
   20. Numeric Key 6
      Enters a '6' after data entry is initiated.

21. Numeric Key 7
    Enters a '7' after data entry is initiated.
22. Numeric Key 8
    Enters a '8' after data entry is initiated.
23. Numeric Key 9
    Enters a '9' after data entry is initiated.
24. Numeric Key A
    Enters a 'A' after data entry is initiated.
25. Numeric Key B
    Enters a 'B' after data entry is initiated.
26. Numeric Key C
    Enters a 'C' after data entry is initiated.
27. Numeric Key D
    Enters a 'D' after data entry is initiated.
28. Numeric Key E
    Enters a 'E' after data entry is initiated.
29. Numeric Key F
    Enters a 'F' after data entry is initiated.
30. Edit Bit On
    A coil is turned on after data entry is initiated.
31. Edit Bit Off
    A coil is turned off after data entry is initiated.
32. Acknowledge Alarm
    Active alarm is acknowledged using this key.
33. Next Alarm
    Next alarm from the container is displayed.
34. Previous Alarm
    Previous alarm from the container is displayed.

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

4.3   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.

In OIS40R "Discret Alarm" is defined.

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

4.4   Application Task-List

Application task-list allows user to define tasks to be performed at **power-on** or while **application** is running i.e. Global Task. Application task-lists are of two types:

1. Power-on tasks:
   Power-on tasks are performed after OIS40R unit is powered on. These tasks are like a boot sequence for OIS40R 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.

   Tasks supported are as follows:
   1.   Goto Screen
   2.   Goto next screen
   3.   Goto previous screen
   4.   Write value to tag
   5.   Add constant value to tag
   6.   Subtract 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
   16.   Copy Tag to LED
   17.   Delay
   18.   Wait
   19.   Copy Recipe Block to PLC Block
   20   Copy PLC Block to Recipe Block

1. Goto Screen:
   Current Screen is replaced by the defined screen. This command does not work when a PLC register is used as STR.

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.* 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, the tag should be a read-write 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 bit can be toggled using this task. The bit / coil will be toggled each time the key is pressed.

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 reeoneous results.

Configuration Software

In this Chapter...

5.1   Introduction

OISetup32 is Microsoft Windows® based software to configure the OIS40R unis 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 OIS40R unit.

Developing your applications for OIS40R 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 applica tion will be a breeze. The idea behind designing OISetup32 and the OIS40R is to allow you to get where you want to... FAST!

You can use OISetup32 to configure OIS40R model from Toshiba Internatinal Corp., to work with ANY of the drivers supported. OISetup32 currently supports over 25 PLCs.

As said earlier, user must first configure OIS40R unit for operating with a specific PLC. OIS40R unit communi cates with a PLC only after downloading correct driver and application into the unit. OIS user should follow the given procedure to configure and use OIS:

1. Create an application for required PLC.
2. Connect IBM cable.
3. Download Firmware i.e. driver for the PLC. OIS40R unit cannot communicate with PLC till the required driver is downloaded.
4. Download application.
5. Now connect the PLC and PLC cable.

5.2   Installing OISetup32 Software

With each OIS40R unit, installer for OISetup32 Software is included on two $3^{1/2}$ inch high-density diskettes.

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 OISetup software:

1. Open Microsoft Windows. The 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 OIS setup will install OIS software in the directory speci fied by the user. Please insert Floppy 2 when the Setup asks.

5.3   OISetup32 Software - Basics

OIS40R unit has to be configured before its use in any system. Complete configuration consists of defining:
- OIS Settings
- PLC node
- Tag Database
- Screens and Screens Task-List, Screen 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 OIS40R.

1. OIS Settings:
   OIS Settings define following properties of OIS40R:
   a. Hardware Settings
      - Application Memory
        The Application Memory of OIS can be changed using this option. *Use this if only you have pur chased a nonstandard unit with a different memory option.*
   b. Keypad options
      - Keypad Queue Size
        If 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.
   c. Printer Port Options
      OIS40R has a Serial Printout Facility. User should connect Serial Printer cable to the Serial Port of the OIS40R. 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.

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.

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.

4. Screens:

   Operator views the PLC data on the screen of the OIS40R unit. Tasks can be defined for a screen. Also, the action for keys when a screen is acting can be defined.

5. OIS Global Key's Task-List:

   All the keys on the OIS40R model can have user selectable definitions. Three types of tasks can be defined for each key: 'Press' Task, 'Pressed' Task, 'Released' Task. Two keys can also be defined for performing Tasks. Each key single or double can have password.
   If for a key, both single and double key actions are defined, the behaviour is not predictable. So take care to define only single or double key task for any key.

6. 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.

7. OIS Application Task-List:

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

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

TOSHIBA

Configuration software for OIS series operator interfaces.

Version 1.00A

© 2001 R.E.P.L.

Ok
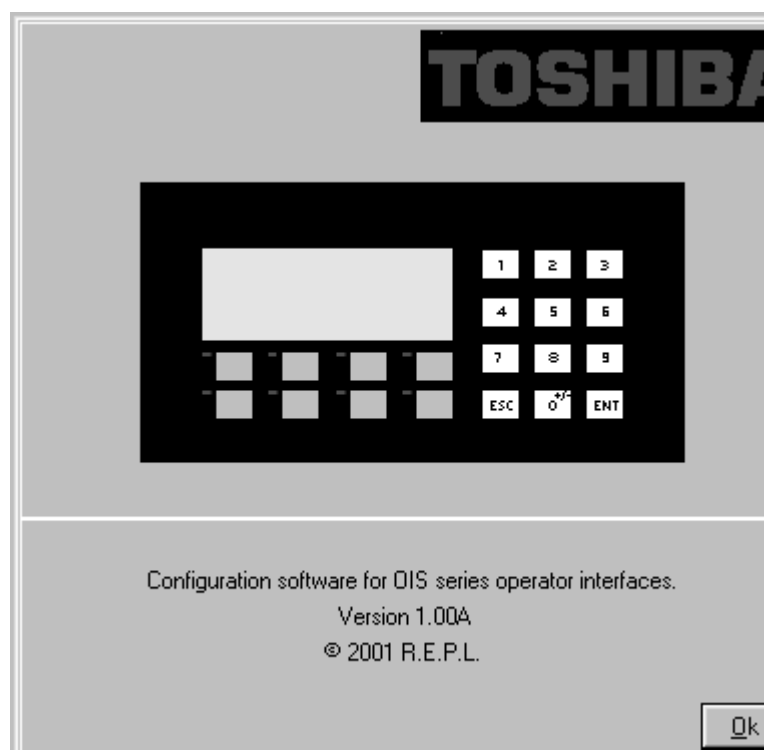
Main window will be displayed after the splash screen. Main window consists of two main parts: Menu Bar and the Tool Station.

OISetup32

File Communicate Utilities Help
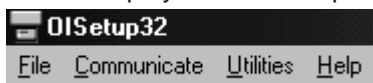
Menu bar operates like any standard Windows Menu bar. Click with mouse or use keys in combination with ALT key just like any other standard Windows based software.

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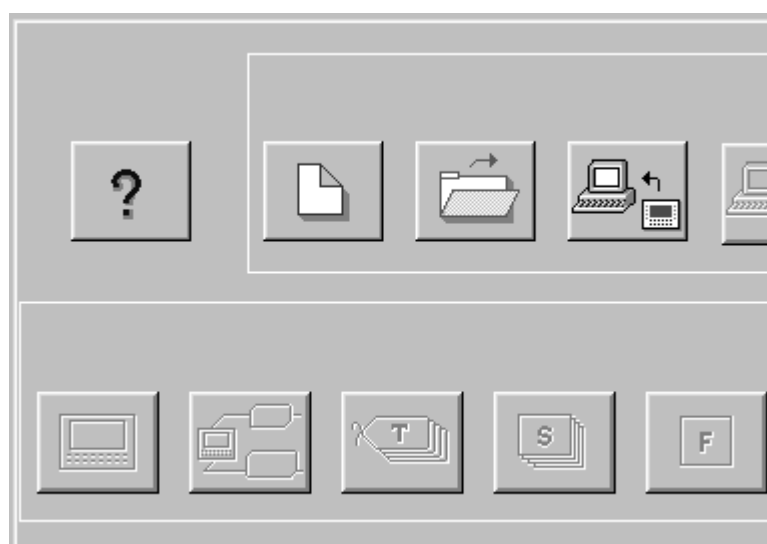
➢ *File* **Menu**

File Menu handles the file related functions.
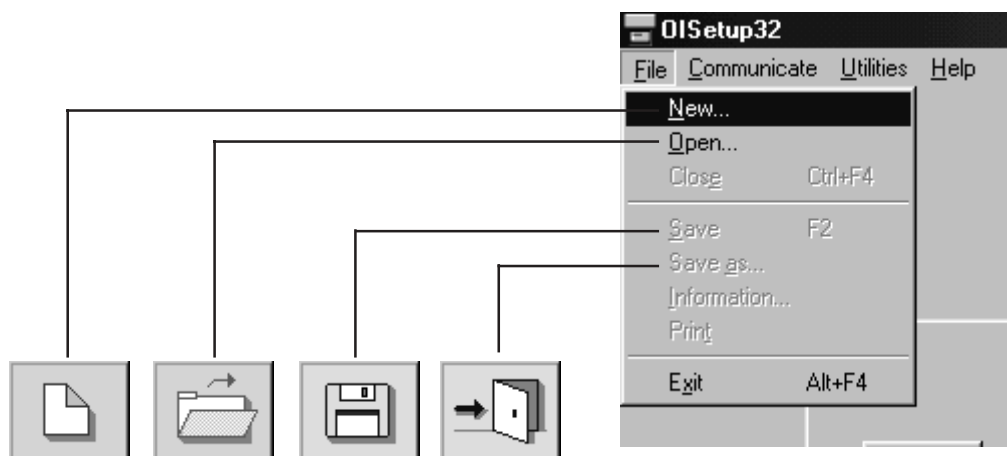
New	-	Creates a new application.
Open	-	Opens a saved application.
Clos**e**	-	Closes currently open application.
Save	-	Saves currently open application.
Save **a**s	-	Saves the current application with a different name.
Information	-	Application related information can be stored here. User can enter his comments here.
E**x**it	-	Exits OISetup 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.
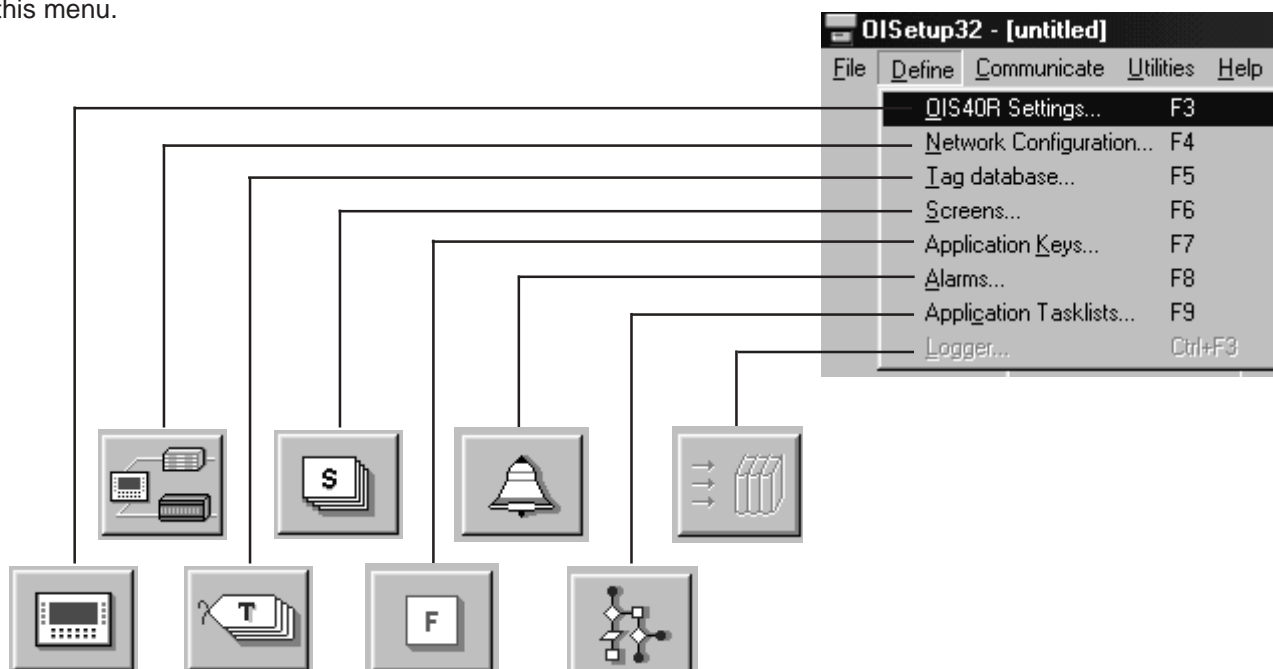
OIS Settings -	Defines OIS settings. *User should change OIS Settings only if he has bought a nonstandard unit or change printer settings.*
Network Configuration -	Defines PLC node, node ID etc.
Tag DataBase -	Defines tag to be used in the application.
Screens -	Defines screens.
Application Keys -	Defines application keys.
Alarms -	Defines alarms in the application.
Application Task-List -	Defines Power-on and Global Task-list.

➢ *Communicate* **Menu**

Communicate Menu Downloads / uploads application to / from OIS.
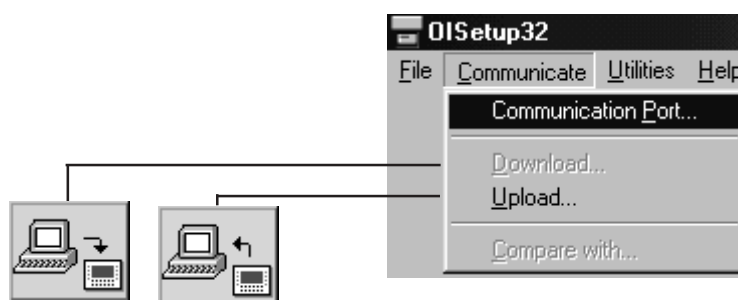
Communication Port	-	Sets COM port for communicating with OIS.
Download	-	Downloads Application to OIS.
Upload	-	Uploads Application from OIS.

➢ *Utilities* **Menu**

Utilities Menu is basically useful for adding / removing PLCs. It also informs the user about the memory used for the application.

```
OISetup32
File  Communicate  Utilities  Help
                   Add or Remove PLCs...
                   OISetup32 memory configuration...
                   Other Utilities...
```
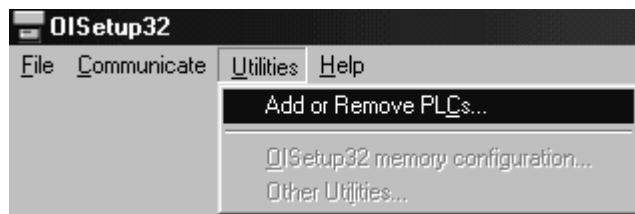
Add or Remove PLCs	-	Adds / removes PLCs to / from the Selected PLCs list.
OIS Memory Configuration	-	Displays statistics of the Memory used by the current application.

➢ *Help* **Menu**

Help Menu, as the name suggests, offers help for the user.

```
OISetup32
File  Communicate  Utilities  Help
                             Index      F1
                             About OISetup32...
```

Index	-	Lists all the Help topics
About OIS	-	Displays the software version number.

5.4 Create new Application

1. Select *New* from *File* menu or click on the *New Application* button.
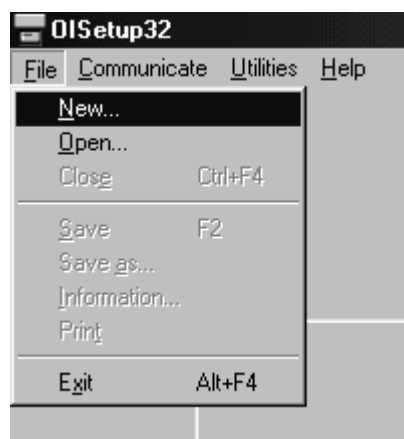
OR
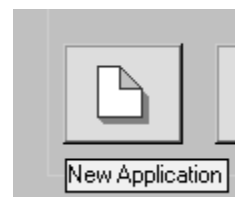
2. In the dialog presented, press *OK*.
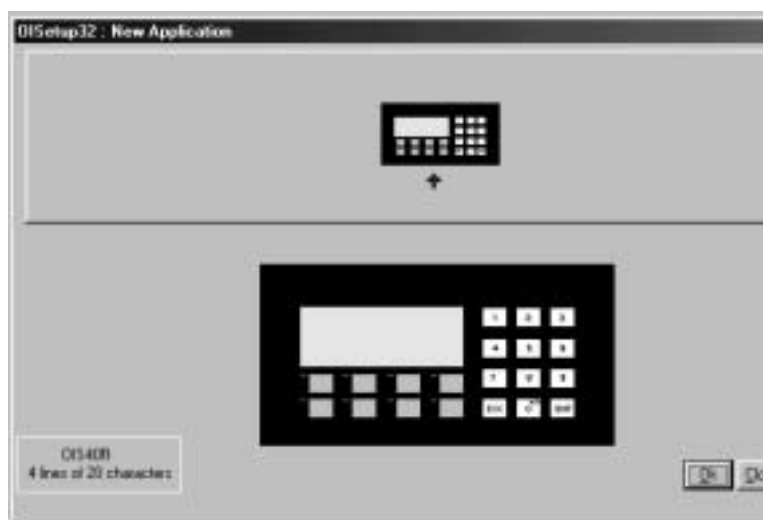
3. Select *OIS Settings* from *Define* menu or Press *F3* key or click on the *OIS Settings* button.
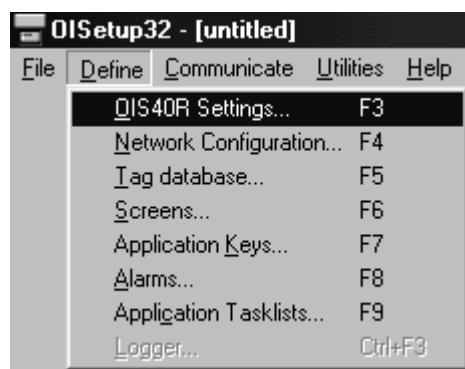
OR
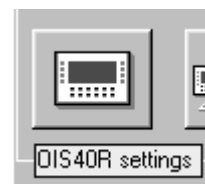
4. In OIS Settings dialog box, select Application memory, Key Queue Size, Serial printout options. Press **OK** to accept the selections made.
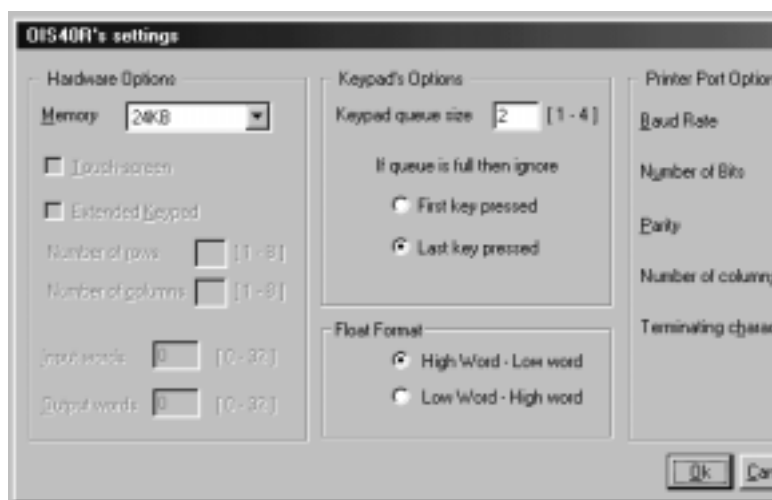
5.5 Setup Network / Node

1. 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.
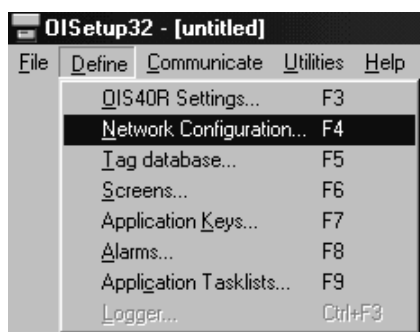
OR
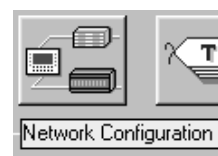
2. In Network Configuration dialog box, Press **Add a Node** button. Now select PLC and PLC Model. Assign a Node Address for the node Press **OK** to accept the selections made. If another node has to be added repeat above steps else press **Close.**
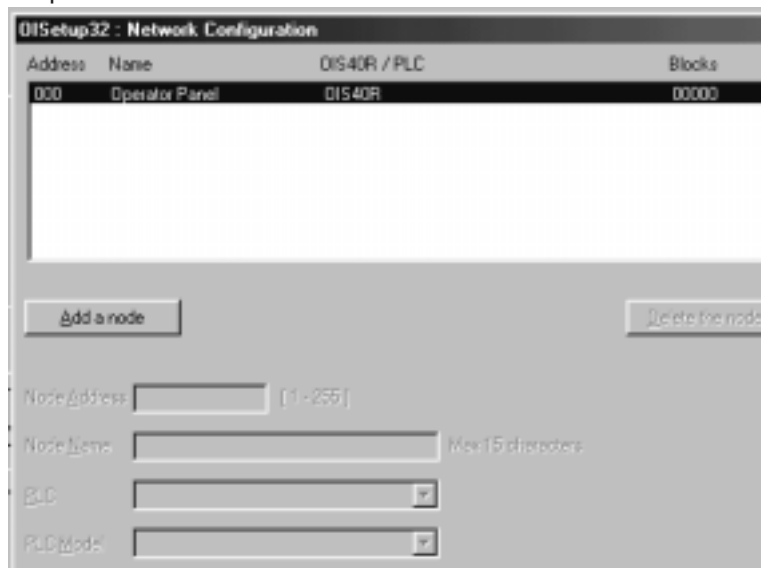
5.6   Create Tag Database

1.   Select *Tag Database..* from *Define* menu or Press *F5* key or click on the *Tags* button.
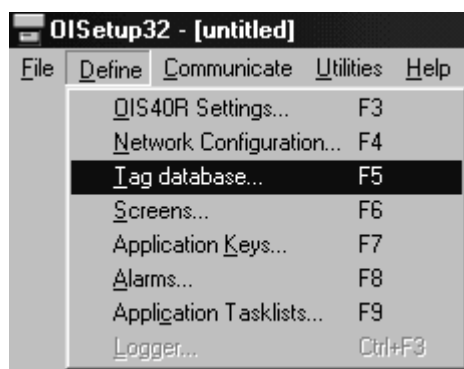
2.   In Tags dialog box select the Node, Tag type, Register, enter Tag name and finally select number of bytes for the Tag. Press *Add* to accept the Tag. After adding all the tags press *Close* button.
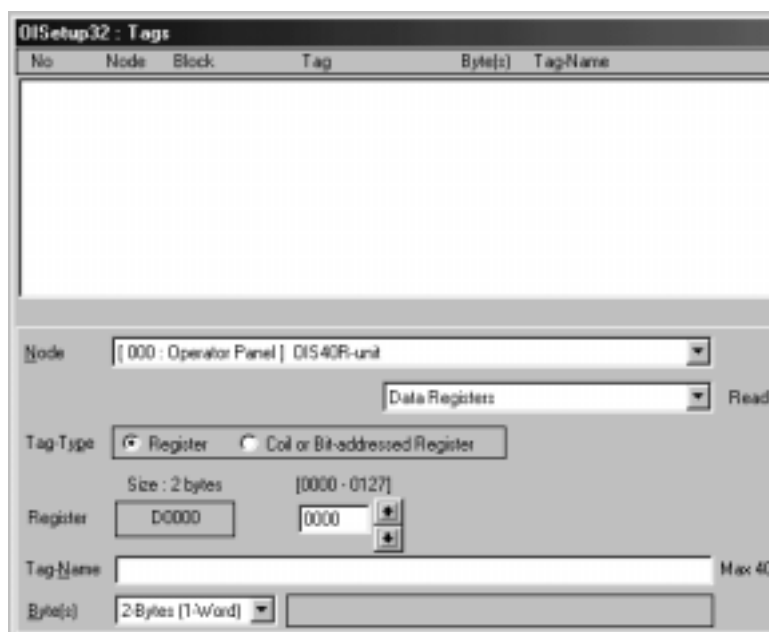
5.7   Create Screens

1.   Select *Screens..* from *Define* menu or Press *F6* key or click on the *Screens* button.
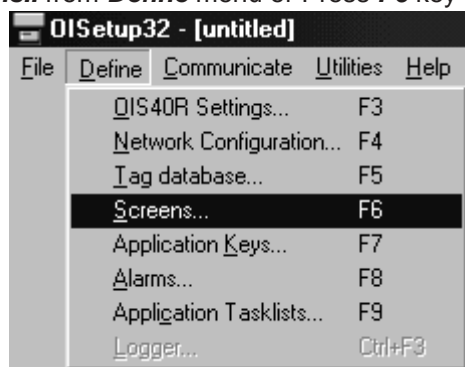
2.   In **New Screen** dialog box, enter the Screen number, Screen Name, Password. Screen Name and Screen description information is for programmers reference only. This information is NOT displayed anywhere on the actual OIS Screen. Associated Screen option is available only when some screens have already been defined. Click **OK** to enter the **Screen Editor**.
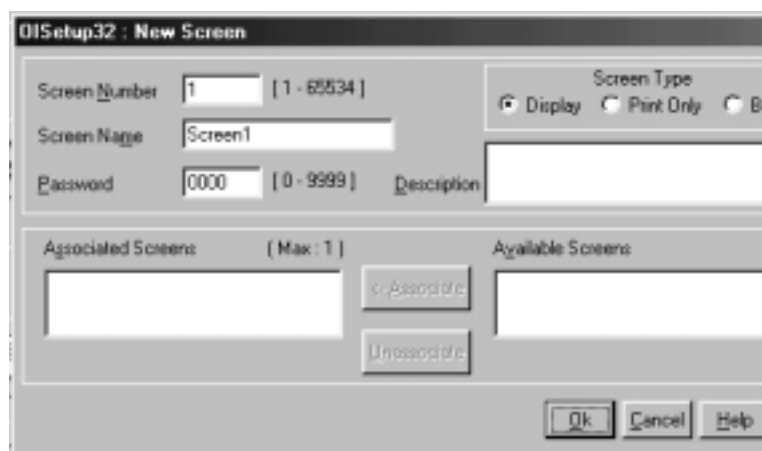
3.   In the **Screen Editor** user can define Screen Objects, Screen Keys and Screen Task List. To place an object click on the respective button in **Objects** window. Pointer will take the shape of the object. Click the mouse at the required location on the screen to place the object. All the tag dependent 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 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.
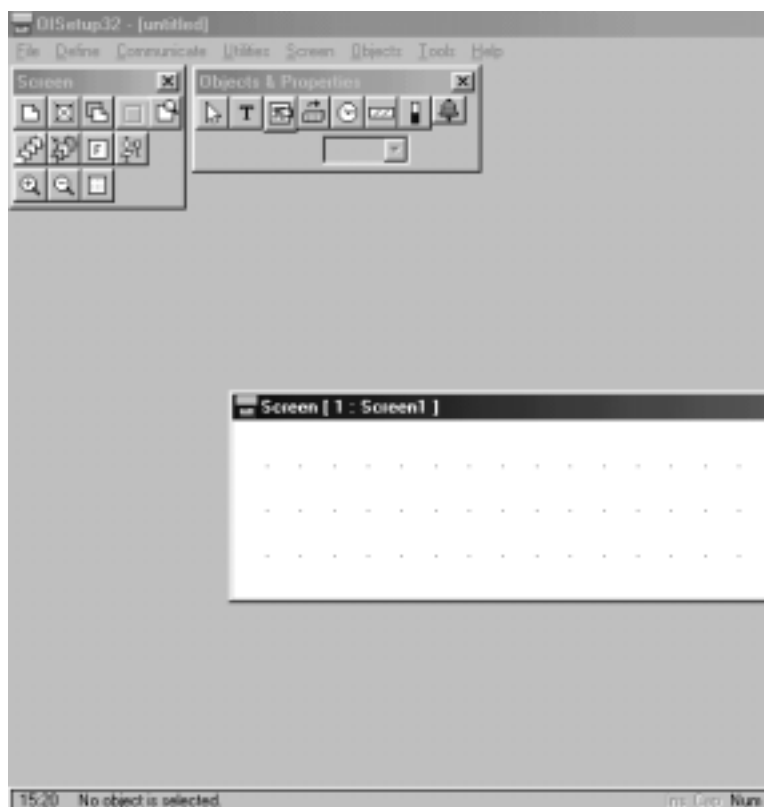
4.　　　How to define Text Object:

Click on the **Text** button ⊤ . The shape of the mouse pointer will change. Now place the mouse pointer at desired location and mark the area of text object while holding the left mouse button. A block cursor will blink at the location inside the text outline. Now enter text. Last character will be overwritten If INSERT Mode (Computer Keyboard) is disabled, else new character will not be accepted.
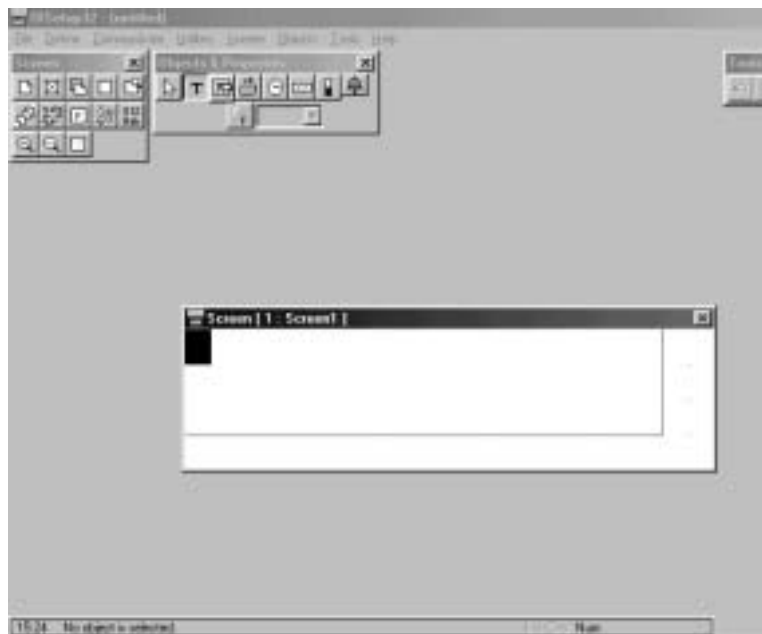
5.　　　How to define Coil Data Entry object:

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 com pleted are Coil Tag and on / off text.
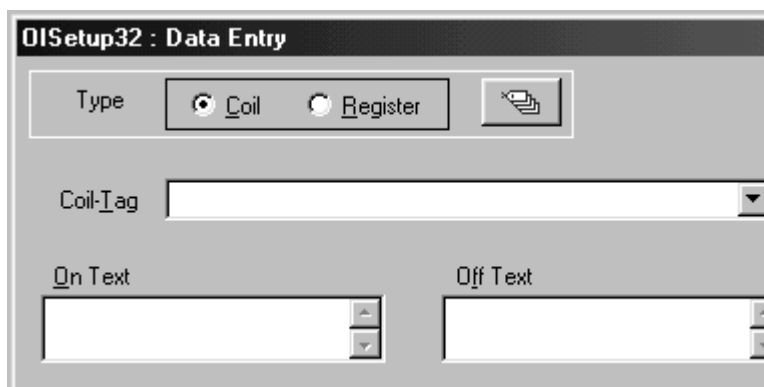
6.   How to define Register Data Entry Object:

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 Low and High limit for the data entry. Data can be entered in various types viz., Unsigned Integer, Signed Integer, Hexadecimal, BCD, Binary (1 word), Float. Data format can also be selected by the user. Low and High limits restrict the data that can be entered in the register. Two mathematical calculations can be performed on the data be entered.
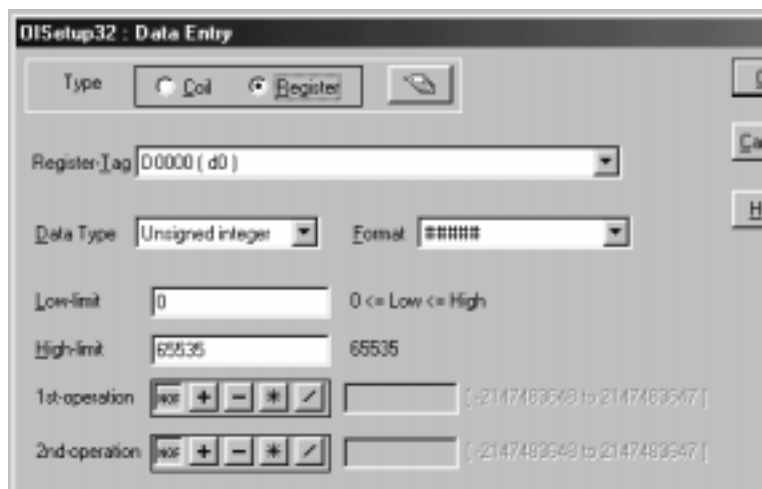
7.   How to define Display OIS / PLC Data object:

This object can be used to view PLC / OIS. To place an embedding object click on 'Display OIS / PLC Data' Tool . In the dialog box user can select either **Bit Text** or **Register Value** or **Register Text**. **Bit Text** displays text depending on the state of coil or bit. **Register Value** displays the actual value of the register. **Register Text** displays text depending on the value of a register. 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 the Coil.
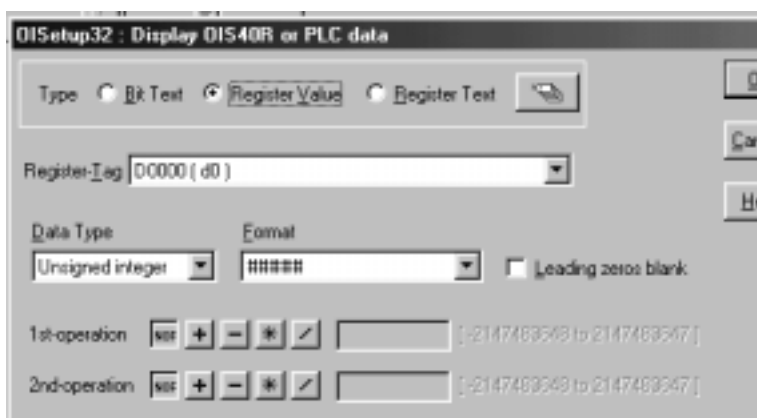
To display a register value, select **Register Value** type in **Display OIS or PLC Data** window. The window will now change to display Register options. Select the register to be displayed. Select the **Data type** and **Format** to display the register. **Leading Zero Blank** option decides whether zeros preceding the value will be displayed or not. If this option is enabled then register value will be displayed without Leading Zeros.
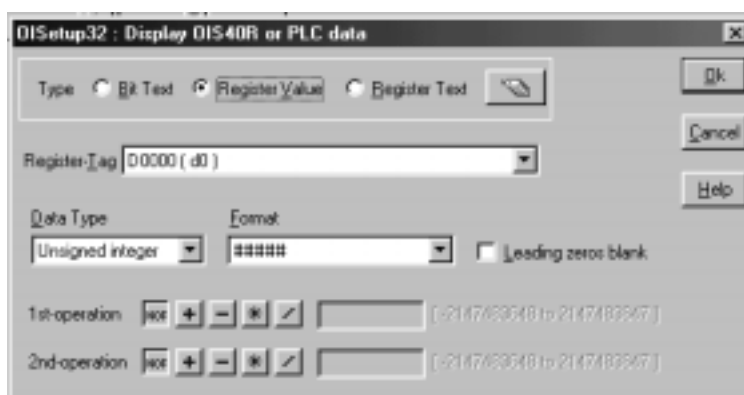
Register Text Object is value dependent text object. User can define different text strings for different limits of register values. When the limit is crossed the text changes. First select the register from the **Tags** list. Now enter low limit, high limit and text for that range. Click **Accept** button to accept the entered data. Now click **Add** to enter new limits and corresponding text.
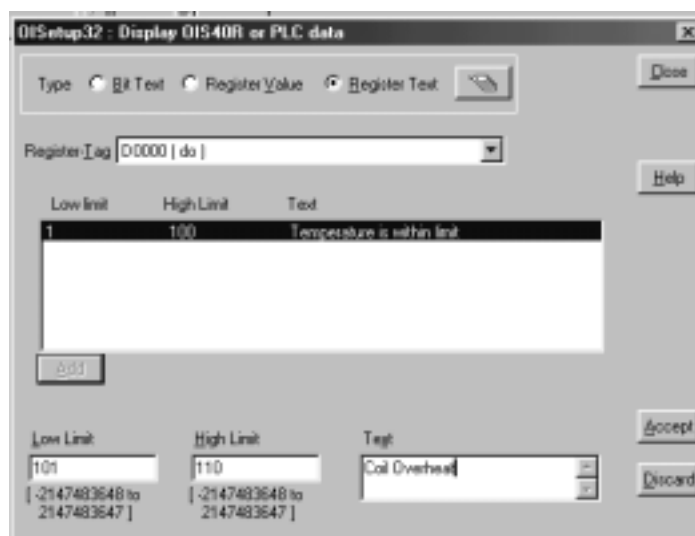
8. How to define Display Date object:

Date can be displayed on the OIS display by placing an **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, user can either select DD/MM/YY format or MM/DD/YY format.

9.   How to define Bargraph object:

Bargraph is a graphical representation of the value of any register. Bargraph is available in the OIS40R model. User can also view the bargraph of a particular range of register value. To place a bargraph click on the Bargraph button [ ].

10.   How to define **Alarm** object:

Alarm object displays 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 object 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.

11.   To assign **Flash Animation** to any object, select the object with the mouse. Place the mouse on the selected object and click with the right mouse button. From the menu box presented select **Animation Properties** option.

12. In the ***Animation Properties*** dialog box select the appropriate animation.
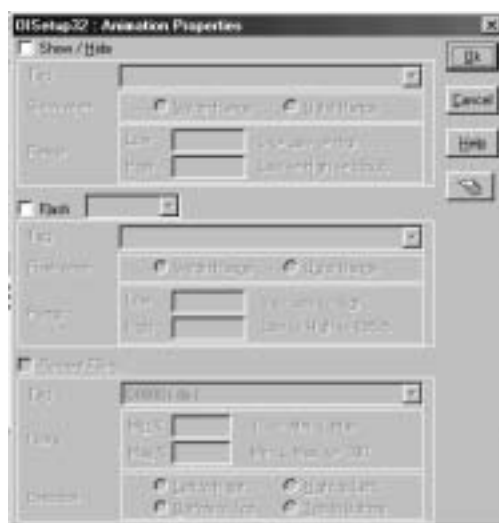
5.8 Define Keys

1. To define Global Keys click on ***Application Keys*** from ***Define*** menu or press F7 or click on Global Keys Button.
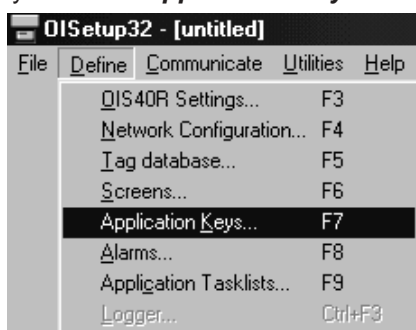
OR

2. In ***Global Keys' Task-Lists*** dialog box, user can assign tasks to keys protect keys by assigning password. All the keys on the OIS40R keypad are redefinable. *Please note Data Entry objects may not function prop erly if the required tasks are not assigned to keys.* Tasks can also be assigned to two keys. The task will be performed only when the two keys are pressed simultaneously.
Click on ***Close*** button to close ***Global Keys' Task-Lists*** dialog box.

5.9   Define Alarms

1.   Click on *Alarms* from *Define* menu or press F8 or click on Alarms Button to define Alarms.
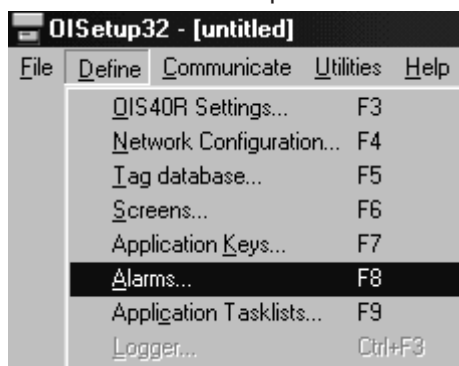
2.   In *Alarms* dialog box click *Discrete*. Select group of alarms. Enter alarm number and alarm text. Click
       relevant options for the particular alarm. Click *Accept* to accept the Alarm.
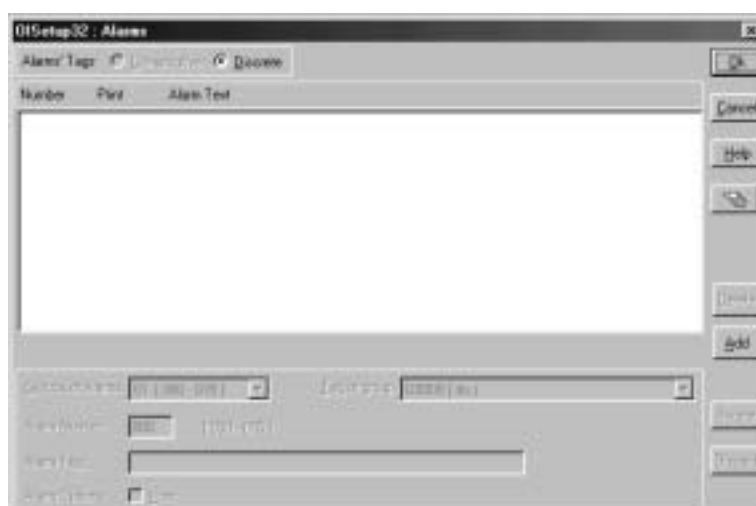
5.10   Application Task-List

1.   Click on *Application Task-List* from *Define* menu or press F9 or click Application Task-List Button to define
       Application Task-List.
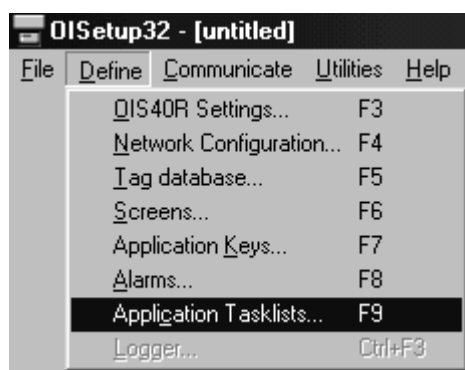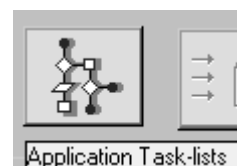
2.   In *Application Task-List* user can define global and power-on tasks. Power-on task List is like a boot sequence for OIS. User must direct OIS to display a particular screen in Power-on Task-List. Global task-list depends on the system requirements. User can either use keys to switch between screens or use a PLC tag to trigger different screens.

5.11   Save Application

1.   To save the application, click on *Save* from *File* menu or press F2.

OR
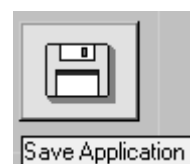
2.   Default location to save application is ..\OISetup\Result\.. directory. Extension should be *.pzm.
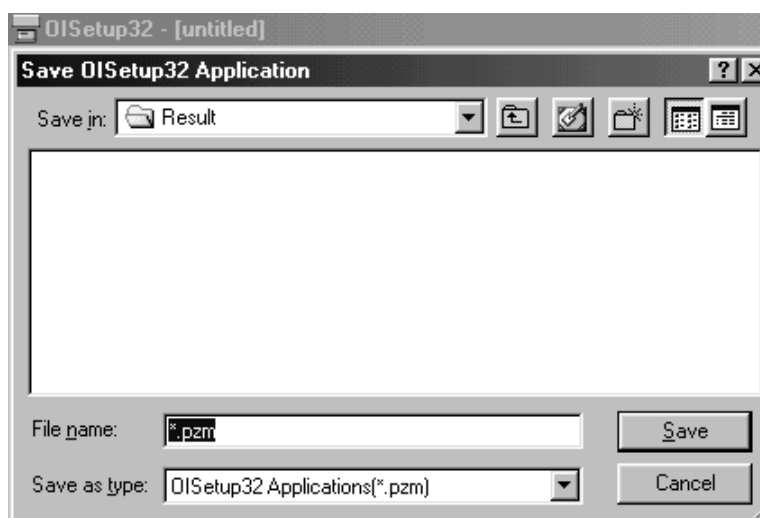
5.12 Download Application to OIS

1. Click on *Communication Port* from *Communicate* menu to set the COM port.
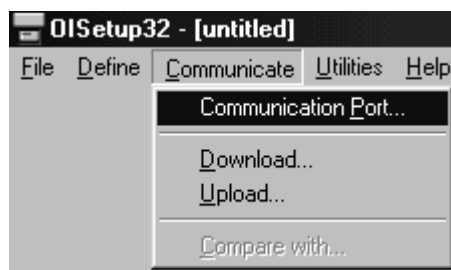
2. Select the appropriate COM port and click *OK* to set the COM port.

3. Click on *Download..* from *Communicate* menu to download application into the OIS40R unit.
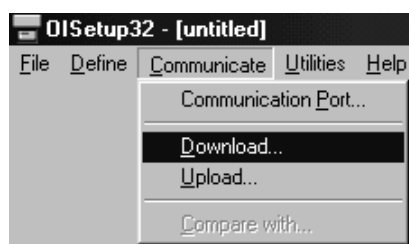
  OR

4. *In Download* dialog box click on *Application*. Click *OK*.
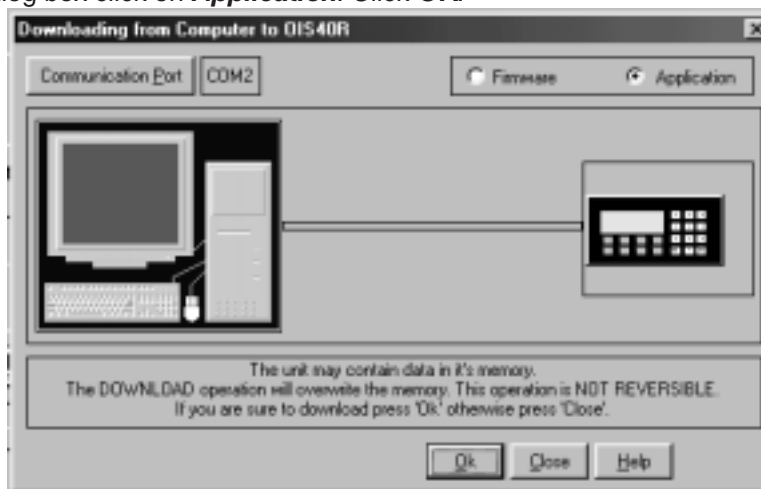
5. After Application Download is successfully completed, click on *Close* to exit Download dialog box.

FAQs

In this Chapter...

6.1 Frequently asked questions

This chapter answers the questions users normally ask.

1. **How can 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?**
    OIS40R 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 alphanu meric 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 ta 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.

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 OIS40R. 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.

<u>Appendix A</u>

OISetup32 Tutorials

Example to create an application

## Tutorial 1:   Create OIS Application

We will create an application for OIS40R unit with internal tags only. Follow the following steps:

1.   Run OISetup32.EXE. Click on the OISetup icon

2.   After the main window is displayed, click on the New Application icon

3.   From the New application dialog box, click [OK] to accept the selection made.
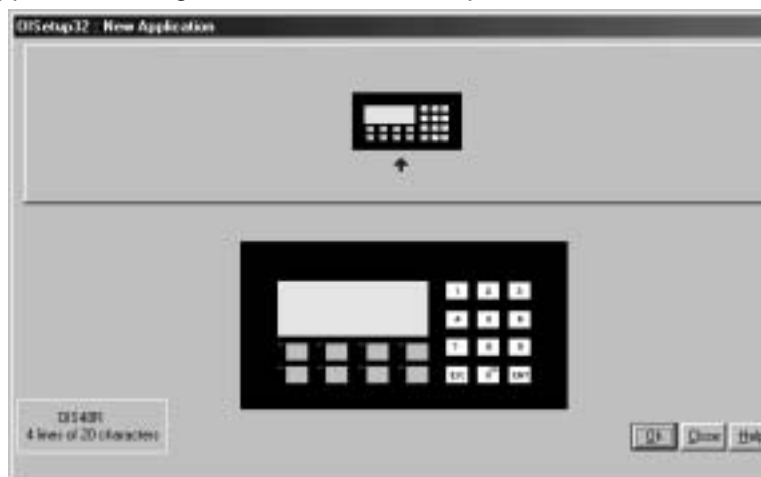
4.   As said earlier, this application is being developed with internal tags only, hence we will not be adding any PLC in the network. If user wants to add PLC in the network, click on the Network Configuration icon

5.   Now we have to define tags required for the application. It is a good practice to define the tags before develop ing the application. To define Tags click on Tag Database icon. Following dialog box will be displayed. Select required register type and register address, enter your name for the tag.
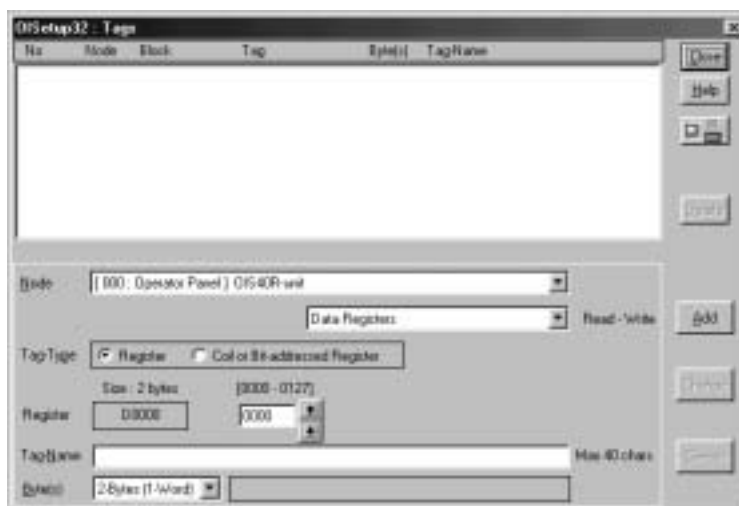
Click on [Add] button to accept the tag defined. To define a coil, change the selection Tag-type. Enter coil number, tag name and click [Add] to accept the tag entry. Then click on [Close] button to close the window

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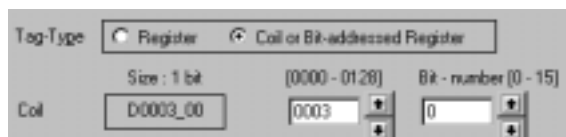
6.   Now we will define Screens. Screens form the most important part of any application as it displays the informa
      tion required by the operator. OIS has various objects to make a screen operator-friendly. Click on Screens
   icon [8]   to define screens.

In the Screens dialog box, enter the screen number, name and password. Also select screen type. 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. Following
Screens window will now appear on the monitor. This window defines all Screen objects, Screen task-list and
Screen keys.
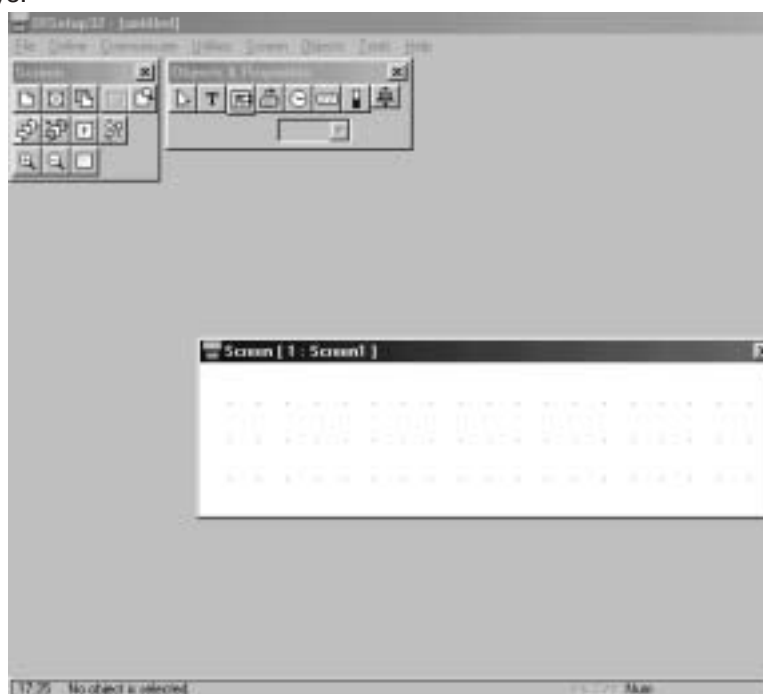
Now we have to place plain text object, click on text icon [T] . Place the object at required place on the
screen and click. A blinking blob will appear.

Enter Text.

Set Pt.=
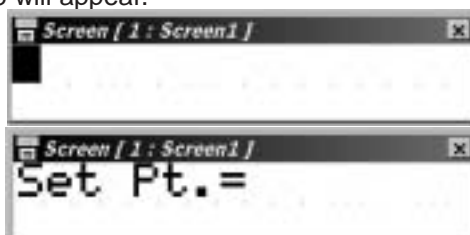
Click on selector icon [▷] to complete text object.

Now we have to place a register data entry with math and limits. To place the object on the screen, click on data entry icon 🖼.

OISetup32 : Data Entry

Select Type 'Register'.

Type ☐ Coil ☑ Register

Select tag from the tag list. Register Tag D0000 (d0)

Select data type and format. We select 'Unsigned Integer' and 5 digit format.

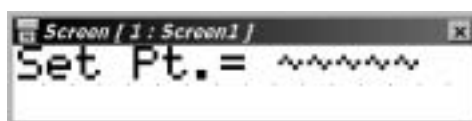Data Type Unsigned integer ▾   Format ##### ▾

Select low and high limit for data entry.
Low limit 500
High limit 10000

To multiply the tag by 3.5 we should define 1st operation as 'x35' and 2nd operation as '/10'.

1st operation [=] [+] [−] [*] [/] 35
2nd operation [=] [+] [−] [*] [/] 10
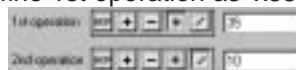
Now click [OK] to accept the data entry. Data entry object will now be placed at required position.

Screen [1 : Screen1]

Set Pt.= ∿∿∿∿∿∿

To place 'Display OIS / PLC data' object click on the icon 📇

OISetup32 : Display OIS40R or PLC data

Select 'Bit Text' type.

Type ☑ Bit Text ☐ Register Value ☐ Register Text

Select coil from tag list. Coil Tag D0003_001 (d3_01)

Enter Bit on text and Bit off text.

Bit On Text: Motor on
Bit Off Text: Motor off

Now click [OK] to accept the data entry. Object will be placed at required location.

Screen [1 : Screen1]

Set Pt.= ∿∿∿∿∿∿
ā ā ā ā ā ā ā ā
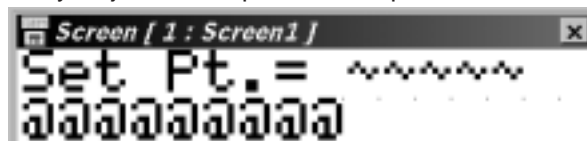
To hold the coil on till a key is pressed screen keys should be defined. Click on 'keys for screen' icon 🖼 . In the Screen keys dialog box select the key to be defined.

OISetup32 : Task-lists of Keys for Screen [1 : Screen1]

Select a Task to add

Set Pt.= ∿∿∿∿∿∿
ā ā ā ā ā ā ā ā

1	2	3
4	5	6
7	8	9
ESC	0	ENT

Goto Screen
Goto Next Screen
Goto Previous Screen
Write value to Tag
Add a constant value to Tag
Subtract a constant value from Tag
Add Tag B to Tag A
Subtract Tag B from Tag A
Turn Bit On
Turn Bit Off
Toggle Bit
Copy TagB to TagA
Swap TagA and TagB
Print Data
Set RTC
Copy Tag to STR
Copy Tag to LED
Delay
Wait
Copy Recipe block to Plc block
Copy Plc block to Recipe block
Copy RTC to PLC block
KEY' specific Tasks

☑ Single Key   ☐ Two simultaneous keys

A Key will act as GlobalKey if no tasks are defined for that Key, for this Screen

☐ Indicates undefined GlobalKey   ☐ Clear the queue and also interrupt the previous

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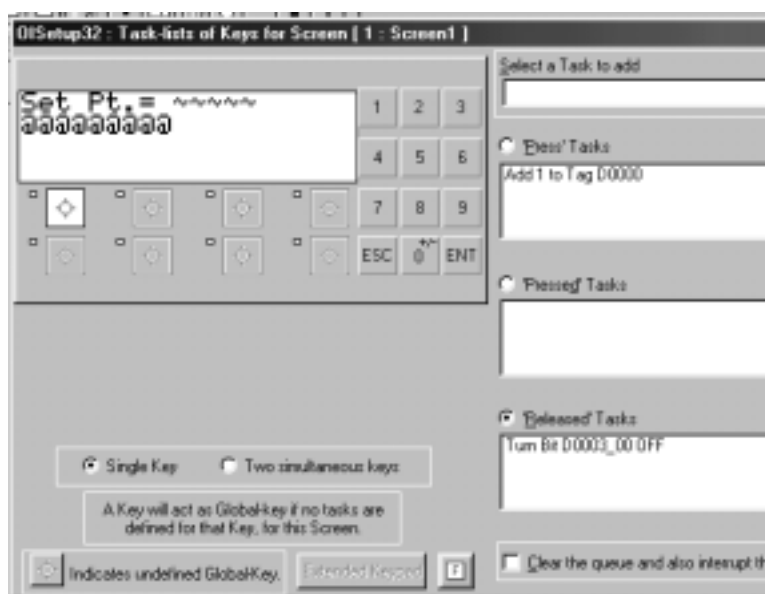Select Turn bit on task as 'press task' for the key.

Select coil. Click [Ok] to accept the task.

Select Turn bit off task as 'released task' for the same key.
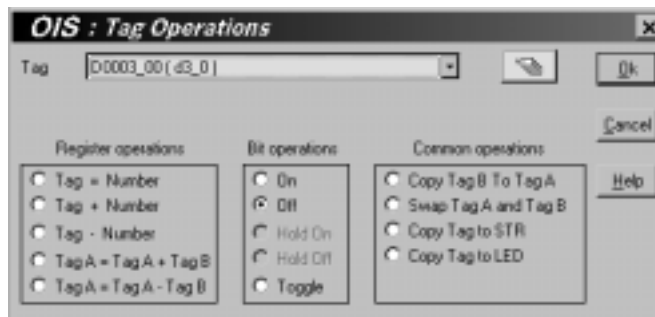
Select coil. Click [Ok] to accept the task.

We want to display an alarm when bit 0 of tag D5 turns on. An alarm object has to be placed on the screen so as to display alarm condition. But as the space on the screen is limited we will create a new screen, screen 2, with alarm object on it. This screen will be triggered when the bit turns on. So in the While showing task list for the screen no 1, a define 'wait till' task followed by 'goto screen' task. So the screen 1 will be displayed till the alarm bit is off. Immediately after the bit turns on the screen will change and display screen 2.

To create a new screen click on New screen icon [🗋] . Enter essential screen information. In screen 2, click on alarm object icon [🔔] . Click on the screen. Alarm object will be placed on the screen. Double click the object to edit.
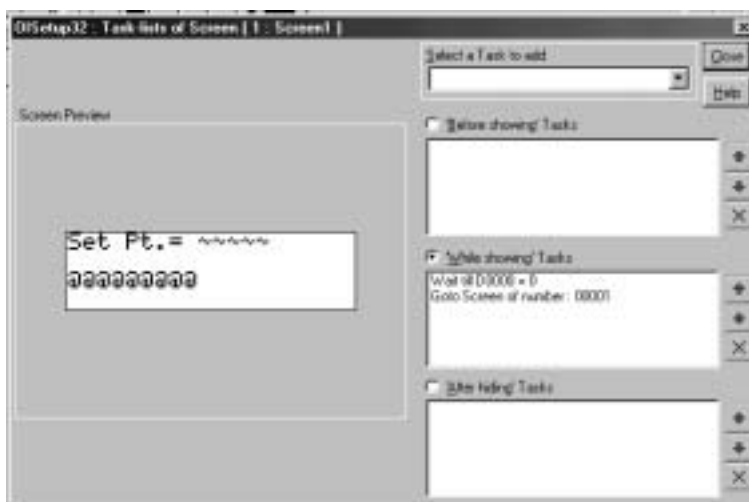
An alarm dialog box will be displayed. This window will enable user to select text to be displayed whrn alarm is displayed. Select item from 'Select From' list and click [Add]. If any item is to be removed select from 'selected' list and click [Delete]. Sequence of selected items can be adjusted using the [Up] and [Down] buttons.
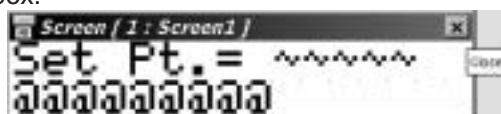

Now go to screen no 1 using 'select screen' icon [icon]. To define while showing task list, click on screen task icon [icon]. Select 'While showing Task'. Add 'wait till' and 'goto screen' tasks.

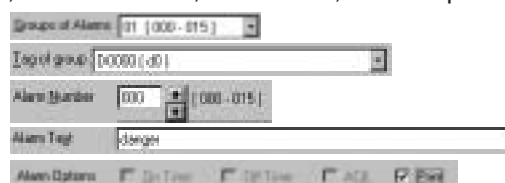Now click [Close] to add the tasks to screen task list.

Now click [×] to close screen dialog box.

Now click alarm icon [🔔] to define alarms. Alarm dialog box will be displayed.

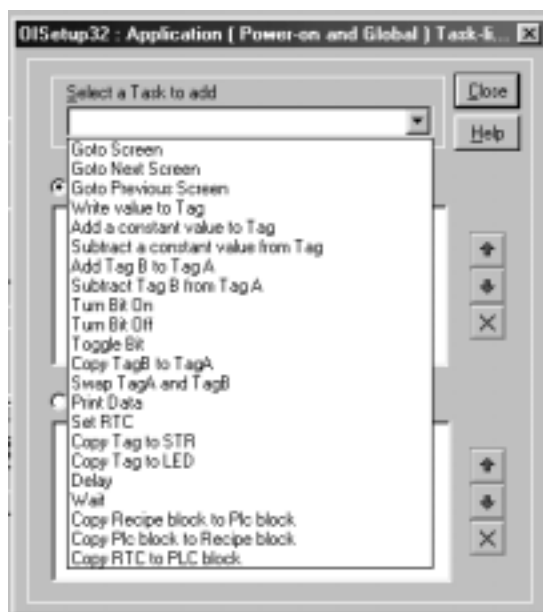Click [Add] to add alarms. We want to define only one alarm for tag D5, so we will select 'discrete' Alarms tags.
Select Group of alarms, Tag of group, Alarm Number, Alarm Text, Alarm Options.

Click [Ok] to accept alarms defined.

Click [icon] to define application Task-list for the application. Here we will define the power-up screen and Global

Task-list if any. Select task from the task-list.

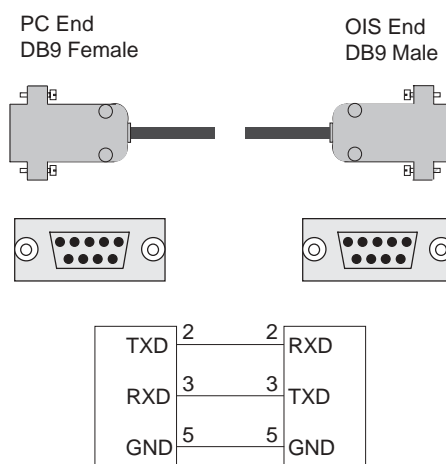Click [icon] to download application.

Select COM port. [Communication Port] [COM2]

Select Application. [○ Firmware   ● Application]

Click [Ok] to download application to OIS40R unit.

Appendix B

Cable Diagrams
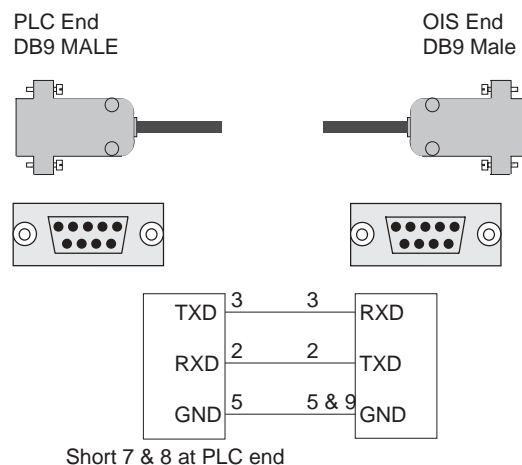
Programming Cable for OIS40R:
Pin Configuration

PC End
DB9 Female

OIS End
DB9 Male

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

Programming Cable for OIS40R to Toshiba T1 PLC:
Pin Configuration

PLC End
8 PIN MINIDIN

OIS End
DB9 Male

TXD	6	2	RXD
RXD	8	3	TXD
GND	5	5	GND

Short 4 & 7 at PLC end
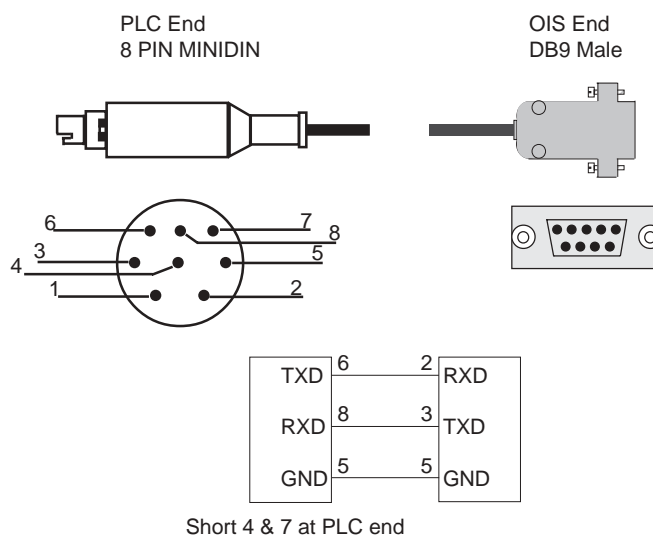
Programming Cable for OIS40R to Toshiba T2 PLC:
Pin Configuration

PLC End
DB9 MALE

OIS End
DB9 Male

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

Short 7 & 8 at PLC end

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Appendix C

Diagnostics & Maintenance

Diagnostics:

**THIS CHAPTER WILL INCLUDE THE DETAILED DE-
SCRIPTION WITH BMP's OF A "TEST" FILE WHICH
WILL PROVIDE YOU WITH THE OISETUP32.
THIS WILL CHECK THE WHOLE UNIT: FUNCTION
KEYS, NUMERICS, LED's, PLC PORT & SERIAL PORT**

Maintenance:

1. Clean the unit from all sides properly using isopropyl solution. Use a clean, soft piece of cloth to clean the unit. 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 windows. Also take care the LCD window should not comes in contact with the material with scrub surface.

2. Do not use benzene, paint thinner or other volatile solvents and do not use chemically treated cloths.

3. Tighten the mounting brackets evenly. Make sure the panel is not dirty or wraped and that it is strong enough to hold the unit.

4. Please note keys on the keypad are only for fingure operations. It should not pressed with pointed tool or any alternative. This will cause failure in key or malfunctioning may cause.
   Max. force that applied to key should not exceed than 30N.

5. Always tighten the connector screws after connecting communication cables.

6. The max. pull load for cables is 30N. Do not apply loads greater than this.