Preface

This manual, TXT DM TLS V6E, is associated with the TXT DM XTEL V6E manual : X-TEL Software Workshop.

It describes the basic software workshop tools which are common to both the X-TEL and MINI X-TEL software workshops :

- XTEL-CONF
- XTEL-MEM
- XTEL-SDBASE
- XTEL-CONTROL
- XTEL-TRANSFER (V5 stations)
- XTEL-TRANSFER (V4 stations)
- PROMPROG

Enhancements made to the X-TEL V52 tools compared to V5 :

- XTEL-CONF tool : can be used with the new modules in the catalogue (analog TBX I/O, dust and damp proof TBX I/O, CCX, etc). See section D1.
- XTEL-SDBASE tool : improved design for increased productivity when designing applications. See section D3.

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Section **Page**

1.1 Presentation

XTEL-CONF can only be accessed from a TSX V5 or PMX V5 station.
For V4 level stations, use:
• XTEL-MEM to select the PLC processor and the memory structure,
• PL7-3 to configure the I/O.

X-TEL and MINI X-TEL Software Workshops allow the user to define, execute and implement applications where the memory is shared between a number of programming and operating programs. Software Workshops integrating XTEL-CONF propose a logical approach to the various application design, programming, integration, download and test steps.

During the design phase, the user declares the dedicated functions used by the station and configures the application using XTEL-CONF, defining a number of parameters such as: type of PLC processor, type and size of the memory cartridge, I/O configuration for the PLC racks and for remote I/O accessed via a FIPIO bus, and the task scan periods.
All of this information lets XTEL-CONF generate configuration files and a file to describe the application structure.
The user can then separately program the various dedicated functions (PL7-3, PL7-COM, etc.).
Integration of the configuration files, application structure and PL7 programs is performed automatically when the entire application is downloaded to the PLC processor.

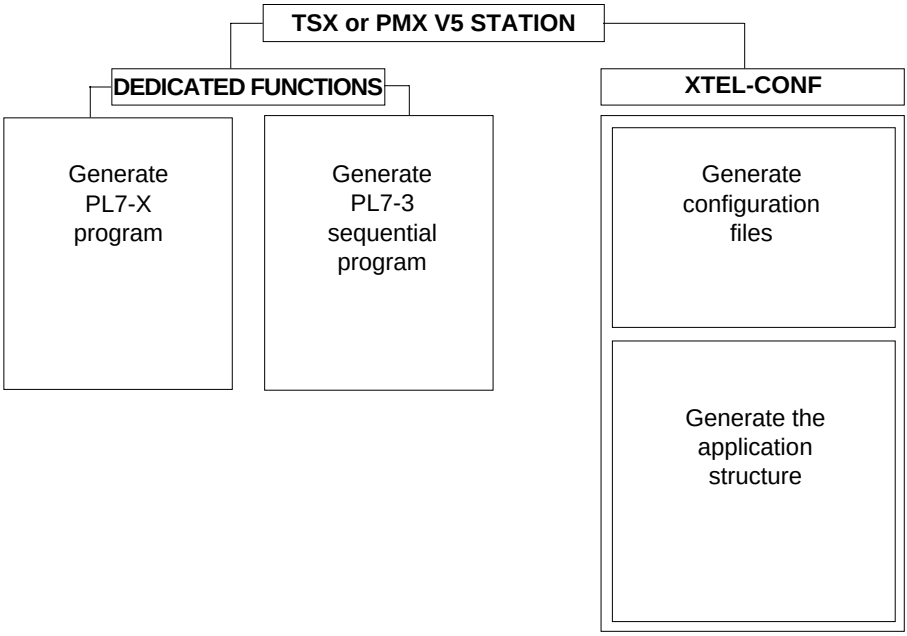
XTEL-CONF can only be used on a TSXV5 or PMXV5 station and performs the following main functions:

- Defining the PLC processor, the size and type of memory cartridge used,
- Configuring the PLC I/O: in the PLC rack and remote I/O accessed via a FIPIO bus,
- Configuring the task scan periods,
- Building the application structure from the configuration parameters and the dedicated functions declared for the station.

The main dedicated functions that can be used are:

- PL7-3,PL7-3 GLD/GLT : Sequential PLC programming,
- PL7-AXE : Axis control programming,
- PL7-COM : Communication module programming,
- PL7-PCL : Analog input module programming,
- PL7-PMS1/PMS2 : PMX process control programming,
- PL7-MMI : Man-machine interface programming.

Organization diagram: Station organization



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Before using XTEL-CONF:

- **In the X-TEL Software Workshop:** It is necessary to define the tools (PL7-3, PL7-X) used by the station for the tool defines the structure of the application according to the functions declared. Any change in the functions used may require regenerating the application structure.
- **In the MINI X-TEL Software Workshop:** It is necessary to have installed all of the tools (PL7-3, PL7-X) that will be used to develop the application.

If one or more tools are installed in the MINI X-TEL Software Workshop and are not used in developing the application, they must be disabled so that they will not be taken into account when XTEL-CONF defines the application layout.

Supported functions:

XTEL-CONF is used during application design and modification phases:

- Configuring the PLC I/O: in the PLC rack and remote I/O accessed via a FIPIO bus,
- Configuring the task scan periods,
- Generating configuration and application files,
- Generating the assigned on-line documentation files.

1.2 Porting TBX CATALOG level V5.0 applications to level V5.5

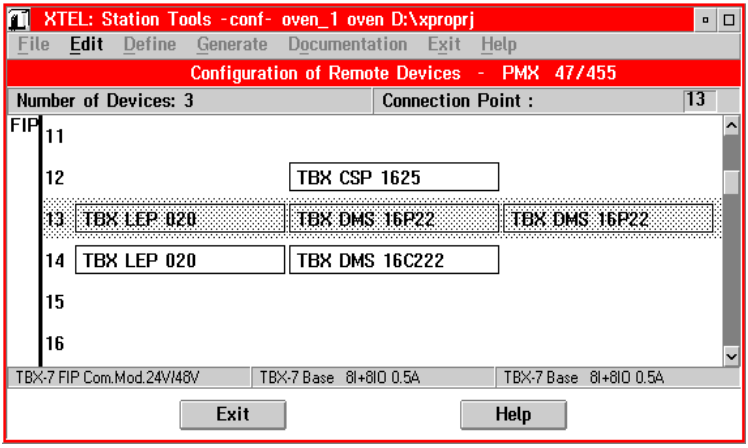
In order to produce applications, XTEL-CONF uses information contained in the 3 catalogue diskettes (TSX CATALOG, TBX CATALOG and FTX/CCX CATALOG), describing those devices which can be configured.

Version V5.5 of the TBX CATALOG improves the TBX DMS16P22 module. This module has 8 programmable I/O. With TBX CATALOG V5.0, the user can program the block of 8 channels either as 8 inputs or 8 outputs. The TBX CATALOG V5.5 improvements enable the user to configure any of the 8 programmable I/O channels as either input or output. Thus with V5.5, the user can benefit from the potential flexibility of this module even more than with V5.0.

If a V5.0 application does not contain a TBX DMS16P22, nothing has to be done to convert it to level V5.5.

In order to convert level V5.0 applications which are already TBX CATALOG V5.0, and which contain at least one TBX DMS16P22 model, to level V5.5, the user must :

- Open XTEL-CONF.
- Select the Define/Remote I/O Config. menu.
- Select, one after another, all the connection points containing 1 TBX DMS16P22 (either as the base module or as an extension).
- Type <enter> + <enter> (the TBX DMS16P22 modules can now be used with the TBX CATALOG V5.5 installed earlier).



In this example, connection point 13 must be selected (12 and 14 are optional).

- Click on Exit
- Select the Generate/Automatic menu.
- Change XTEL-CONF to an icon.
- Open the PL7-3 function.
- Select the V5-CONF soft key.
- Select the reconfiguration item.
- Select YES for reconfiguration request.
- Finally, save the new PL7-3 application by pressing the SAVE key.

If PL7-3 displays the following message :

16226 REMOTE I/O NOT CONFIGURED

this is because one of the connection points containing a TBX DMS16P22 has not been selected in the XTEL-CONF phase. This phase must be repeated. At this stage, it is perhaps useful to know that the user can also type <enter> + <enter> on ALL the connection points of the FIPIO application. In some cases, this is as easy as looking for the TBX DMS16P22s.

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1.3 Functions

1.3-1 Entering the Local and Remote I/O Configuration

This is the first phase when building the application. It requires entering:

- The I/O configuration of the PLC racks:
  - Type of PLC processor, this selection in turn sets:
    . The size of the internal RAM and the memory cartridge,
    . The number of I/O racks that can be accessed,
    . The number of connection points on the FIPIO bus,
    . The number of tasks that can be configured.
  - Each module type and its location,
  - The terminal blocks used,
  - The tasks used.
- The remote I/O configuration accessed via a FIPIO bus, defining:
  - The devices and each connection point,
  - Any parameters that are specific to a device (for example for TBX remote I/O modules, the task where they are used and their operating parameters, etc.).

The configuration parameters can also be taken from computer assisted design tools.

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1.3-2 Entering Task Periods

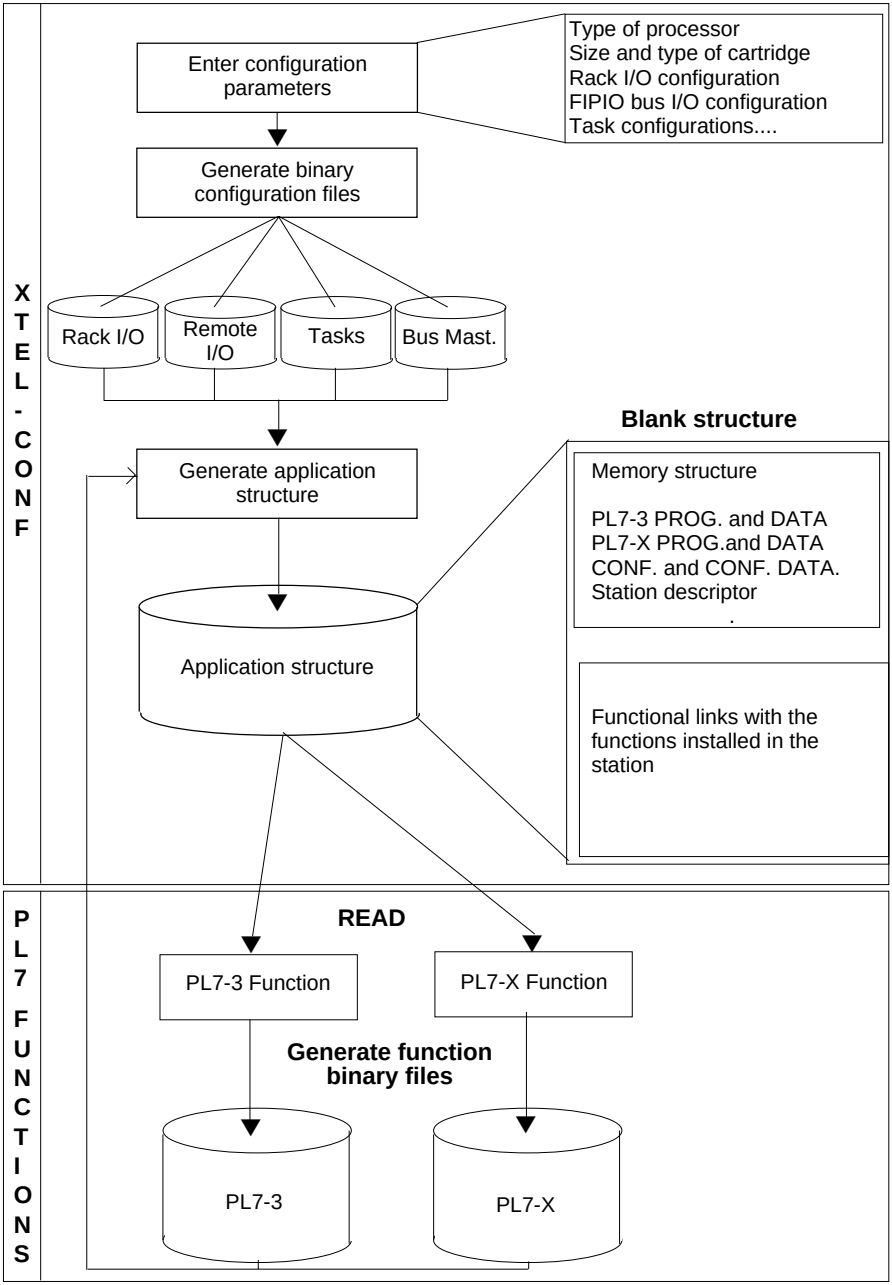
The master task (MAST) is always configured regardless of the type of processor used and cannot be deleted. By default, its period is set to 50 ms and can be set within a range of 1 to 255 ms. If the application requires using fast tasks (FAST) and/or auxiliary tasks (AUX.), their task periods are also defined in XTEL-CONF with a coherence check performed on their periods.

1.3-3 Generating Configuration Files and the Application Structure File

Once the various configuration parameters (processor type, type and size of memory cartridge, I/O configuration in the racks, FIPIO bus remote I/O configuration, task periods) the system can generate:

- Binary configuration files:
  - Local rack I/O configuration,
  - Remote I/O rack configuration,
  - Task configuration,
  - Bus master configuration,
- The application structure file that defines the memory layout of the application depending on the various configuration elements and on the various dedicated functions (PL7-3, PL7-X) used by the station.

1.3-4 Overview of XTEL Architecture



1.3-5 Associated On-line File

XTEL-CONF also supports the ability to document the application from the information contained in the files generated by XTEL-CONF.

Generating the file
XTEL-CONF automatically creates a documentation file on request from the user. This file is stored in a documentation file on the hard disk.

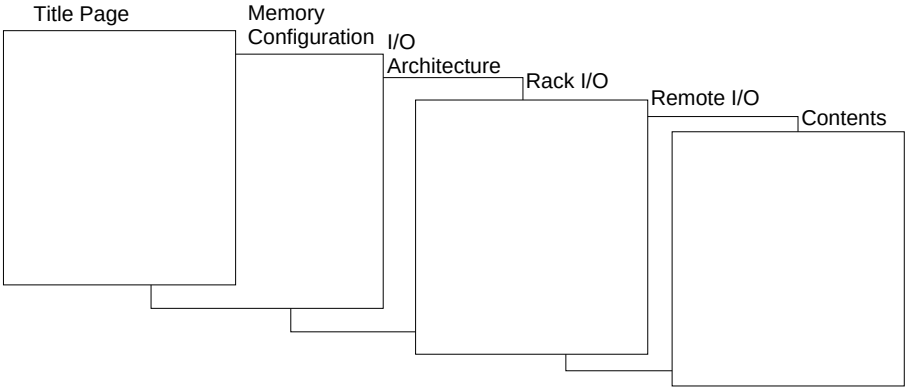
Note:

> The last configuration parameters entered are only taken into account in the documentation file once the configuration has been generated. XTEL-CONF uses the configuration files that are validated, generated and stored on the hard disk.

Data entry
The user only intervenes to enter information used in the title page and to customize the file footer.

File contents
The file that is generated comprises the following headings:

- Title page
- Memory configuration: List of dedicated functions, type of PLC processor, size and type of memory cartridge, memory structure, task scan periods.
- I/O architecture: Graphic representation of all of the PLC racks and configured FIPIO devices.
- Rack I/O: Describes the contents of the racks (power supply, processor, I/O modules, intelligent modules) and the wiring for each module.
- Remote I/O: Describes the list of devices connected to the FIPIO bus.
- Contents.



Viewing the file
The user can view the file on-screen by scrolling the entire documentation file.

Printing the file
The documentation file can also be printed out to a semi-graphic printer (IBM or compatible) in A4 page format.

Deleting the file
The user can delete the documentation file (when necessary, for example to recover disk space).

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Points to Remember about XTEL- CONF

• **Application configuration**
- Defining the PLC processor used and the size and type of memory cartridge,
- Configuring rack I/O,
- Configuring FIPIO bus remote I/O,
- Entering the scan periods for the various tasks,
- Generating binary configuration files.

• **Generating the application file that defines:**
- The application memory layout,
- The functional links between the dedicated functions used by the station.

• **Generating an application file that can be:**
- Viewed on-screen,
- Printed by a semi-graphic printer.

1.4 Accessing the XTEL-CONF Tool

The XTEL-CONF tool is accessed:

- In the X-TEL Software Workshop: from the Stations Tools available to the user for managing a TSX V5 or PMX V5 station in the X-TEL Software Workshop,
- In the MINI X-TEL Software Workshop: from the primary window.

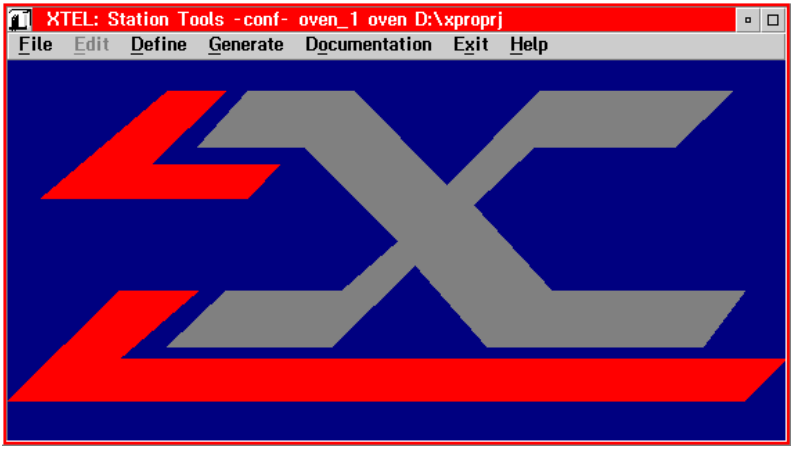
X-TEL

Seelct a Volume
Select a Project
Select a Station
Select XTEL-CONF from Station Tools

MINI X-TEL

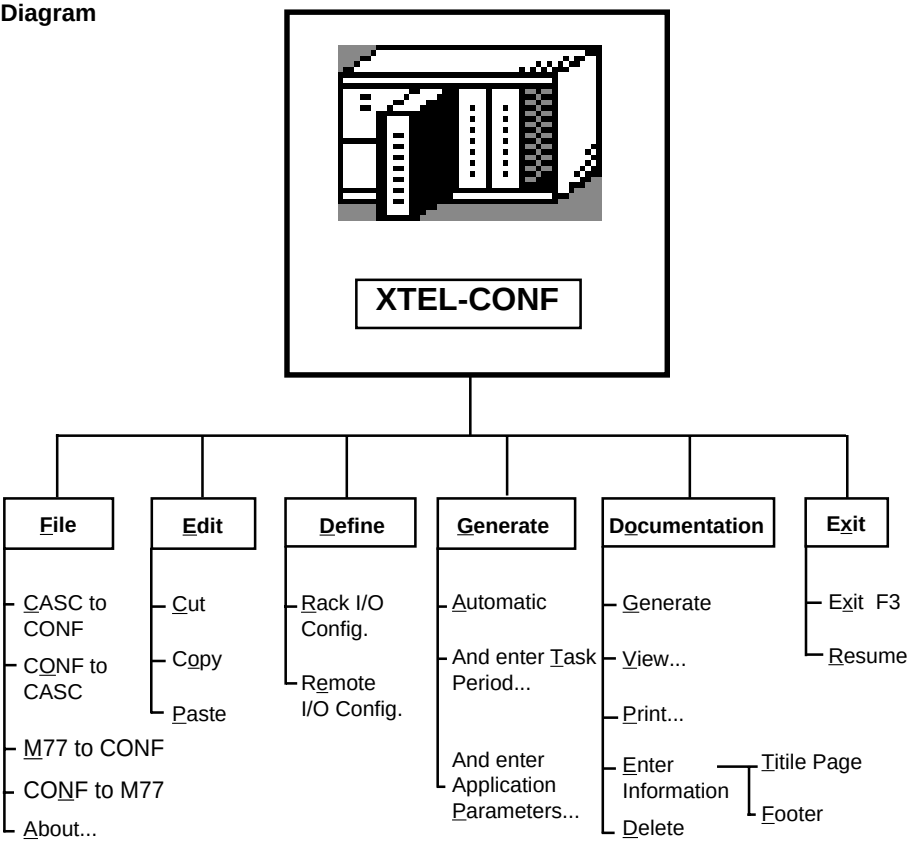
Primary window
Select XTEL-CONF from the primary window

Primary window



The primary window of the XTEL-CONF tool lets the user select an action to execute from those proposed in the menus displayed by accessing the action bar.
XTEL-CONF retains the standard layout of all X-TEL or MINI X-TEL screens and the user can use the keyboard or the mouse to move between screens or make selections.

Diagram



File Menu

CASC to CONF	Connects XTEL-CONF to XTEL-CAD for importing CAD files into XTEL-CONF.
CONF to CASC	Connects XTEL-CONF to XTEL-CAD for exporting files to CAD programs.
M77 to CONF	Generates a complete application (memory layout, configuration and binary file) from a file created using Monitor 77.
CONF to M77	Generates a complete application file comprizing the layout, ts configuration and the various binary files, for use in Monitor 77.
About...	Displays an information message on the program, its name, version level with Telemecanique Copyright information.

Edit Menu

- **Cut** — Deletes from the configuration the rack or FIPIO bus device selected by the cursor.
- **Copy** — Copies to the clipboard the rack or FIPIO bus device selected by the cursor.
- **Paste** — Restores to the line selected by the cursor, the element previously cut or pasted.

Define Menu

- **Rack I/O Config.** — Defines the hardware architecture of a PLC configuration with its racks and types of modules.
- **Remote I/O Config.** — Defines the hardware architecture of devices connected via a FIPIO bus.

Generate Menu

- **Automatic** — Automatically generates binary configuration files and the application layout file.
- **And enter Task Period...** — Supports entry of task periods prior to generating the configuration binary files and the application layout file.
- **And enter Application Parameters...** — Lets the user enter the size and type of memory cartridge used and the memory field layout.

Documentation Menu

- **Generate** — Generates the documentation file.
- **View...** — Displays the contents of the documentation file on-screen.
- **Print...** — Prints the documentation file.
- **Enter information** — Enables access to the title page and footer sub-menus:
  - **Title Page** — Enables entry of information for the documentation file title page.
  - **Footer** — Enables entry of information for the documentation file footer.
- **Delete** — Deletes the documentation file.

Exit Menu

- **Exit F3** — Quits XTEL-CONF. This action does not save any modifications made using the tool. To save them, perform a Generate action.

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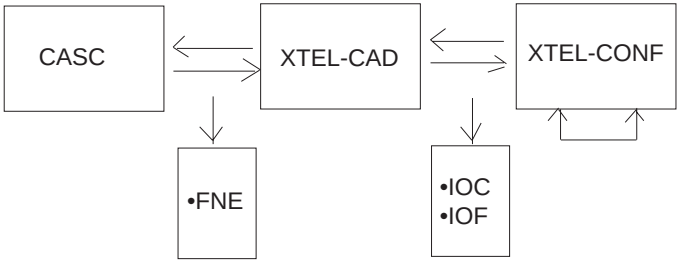
1.5 File Menu

This menu lets the user access functions used to exchange I/O configuration files with a CAD program and to exchange applications with Monitor 77.

1.5-1 File Exchanges Between CAD Programs and XTEL-CONF



File format conversion is performed using XTEL-CAD.

CASC to CONF exchange
This function reads I/O configuration files from a CAD program and converted by XTEL-CAD into a format that can be reused by XTEL-CONF.

CONF to CASC exchange
This function writes the I/O configuration to a file that can be converted by XTEL-CAD into .FNE format for use by a CAD program.

1.5-2 File Exchanges Between Monitor 77 and XTEL-CONF

CONF to M77 exchange
This function builds a single station application file that combines all of the applications for the various station functions (XTEL-CONF, PL7-3, PL7-COM, etc.). This single file can be uploaded to a V5 level PLC station by Monitor 77.

M77 to CONF exchange
This function is the opposite of the previous one and is used to import to the station a single file obtained by downloading a PLC station under Monitor 77, containing all of the functions of the station (XTEL-CONF, PL7-3, PL7-COM, etc.).

1.6 Define Menu

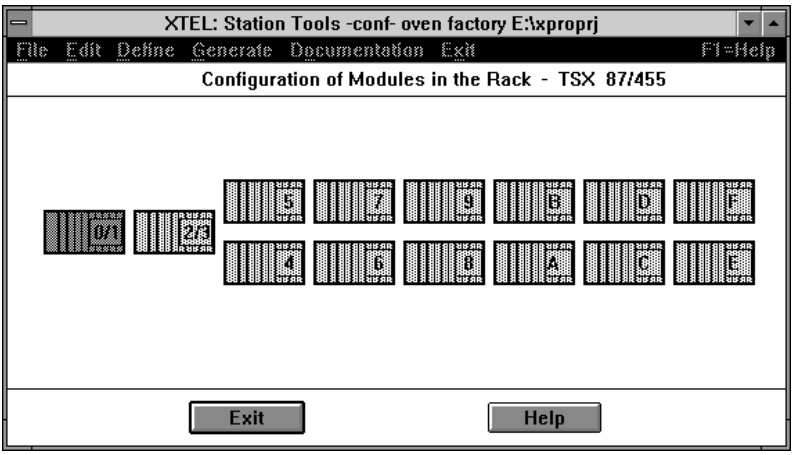
This menu lets the user access two functions:

- Configuration of rack I/O (defining power supplies, processor, discrete I/O modules, intelligent modules, etc.),
- Configuration of remote I/O accessed via a FIPIO bus. This can only be configured if the PLC processor declared in the rack I/O configuration has built-in support for FIPIO/ FIPWAY.

1.6-1 Rack I/O Configuration Function

The Model 40 PLCs are completely modular in design. The PLC configuration is formed with separate components (empty racks, power supply, discrete I/O, intelligent modules, etc.). Configuring the rack I/O comprises describing the hardware configuration according to the racks and types of modules installed.

First function window



This screen is the first rack I/O configuration screen. The display is the same for all types of PLC. Some characteristics change according to the type of PLC processor selected and the number of racks that can be accessed:

- Racks that cannot be accessed are shown in white,
- Racks that can be accessed but not configured are shown in light grey,
- Racks that are configured are shown in dark grey.

The first time that the rack I/O configuration screen is accessed the following default values are displayed:

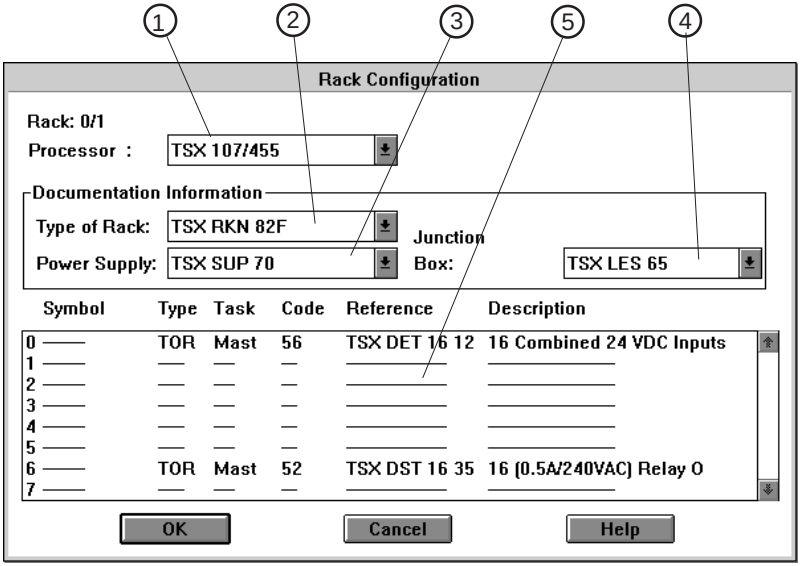
- TSX P47 405 processor for a TSXV5 station with Racks 0/1 and 2/3 not configured but accessible (this is the maximum configuration supported by a TSX P47 405 PLC),
- TPMX P47 425 processor for a PMXV5 station with Racks 0/1 and 2/3, 4, 5, 6 and 7 not configured but accessible (this is the maximum configuration supported by a TPMX P47 425 PLC).

Actions allowed:

- **Accessing the rack configuration:**
  The rack configuration is accessed by double clicking on (or using the <Tab>, Cursor and <Enter> keys to select) the rack to configure.
- **Cut/Copy/Paste a rack:** Refer to Sub-section 1.6 "Edit Menu". These action let the user cur or copy the complete configuration of a rack.
  The <Del> key lets the user delete the complete configuration of a selected.
- **Buttons:**
  Exit **:** Returns the user to the XTEL-CONF primary window,
  Help **:** Calls-up on-line Help on the selected screen.

Rack configuration screen

This screen has a number of fields that allow the user to define the rack configuration without needing to type in the data, simply by selecting the various elements from pop-up lists (that are accessed by clicking on the arrow to the right of the field or by pressing the <Alt>+<F4> keys) or from catalogs.



OK **:** Confirms the entries made during the current session,

Cancel **:** Cancels the entries made during the current session.

① **"Processor" field**

This field can only be accessed in rack 0/1. It lets the user define the type of PLC processor used in the configuration. The type of PLC processor selected will determine the type and number of elements that can be configured:

- Number of racks accessible and their type,
- Type of power supply and the number of tasks,
- Number of modules and types of network,
- Number of devices on the FIPIO bus,
- Memory capacity (internal RAM and memory cartridges).

If when the processor type is changed, this causes incoherence with the currently selected processor, the system will refuse the change and the user will have to resolve the incoherence problems (number of racks supported less than the number configured, higher capacity power supply, etc.).

② **"Type of Rack" field**
This field lets the user define the type of rack to use (standard, 19", short, full bus, simplified bus, rear mounting, front mounting). The selection of the type of rack will affect:
- The number of slots available for modules (5, 7 or 8),
- The types of modules that can be configured (Discrete I/O, Intelligent I/O), the type of power supply.

If when the type of rack is changed, the systems detects an incoherence, it will refuse the change.

③ **"Power Supply" field**
This field lets the user define the type of power supply to use.

④ **"Junction Box" field** (optional field)
This field lets the user define the type of junction box to use with the PLC processor. This is necessary each time the configuration comprises:
- Local or remote I/O extension racks,
- FIPIO bus remote I/O,
- UNI-TELWAY bus devices,
- FIPWAY network devices.

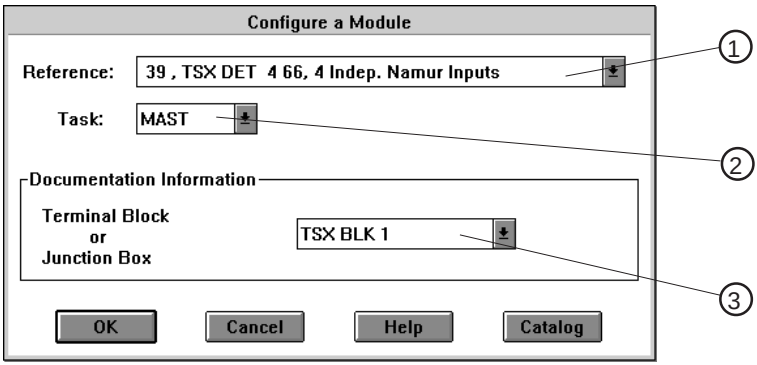
⑤ **"Modules" field**
This field lists all of the modules in the rack and their respective locations once configured.
To configure a module, double click on the module to configure (or press the <Tab>, Cursor and <Enter> keys).

It is also possible to make multiple selections and configure or delete a number of modules at the same time by pressing the <Del> key.

Multiple selections:
- For consecutive modules: Press <Shift> while making the selections or click and hold down the mouse button while dragging the mouse cursor to the last module.
- For non-consecutive modules: Hold down <Ctrl> while making the selections.

<CTRL> / : Selects all slots,
<CTRL> \ : Cancels the selection of all slots.

Configure a Module screen



Three fields can be accessed from the module configuration screen, each allowing the user the ability to display a list of possible elements available:

① **"Reference" field**

This field lets the user define the type of module to use in the selected slot. The selection is made from a catalog that lists all of the modules available. The catalog can be accessed directly from the field (access the list of all modules), or by selecting the Catalog button (selective access by family).

② **"Task" field**

This field lets the user define the type of task that the module will be used in. The list of tasks displayed by the system depends on the type of processor selected. The access procedure is the same as that of the field shown in (1).

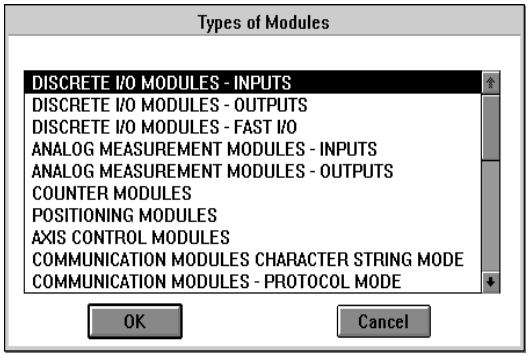
③ **"Junction Box or Terminal Block" field**

This field lets the user define the type of terminal block to mount on the module. TSX BLK • (for Discrete I/O modules, etc.) or TSX LES • (for TSX LES•••/LFS ••• modules) terminal blocks. The access procedure is the same as that of the field shown in (1).

OK: Confirms the entries made in the module configuration screen.

Cancel: Cancels the entries made in the module configuration screen.

Catalog: Calls-up the list of module families available.



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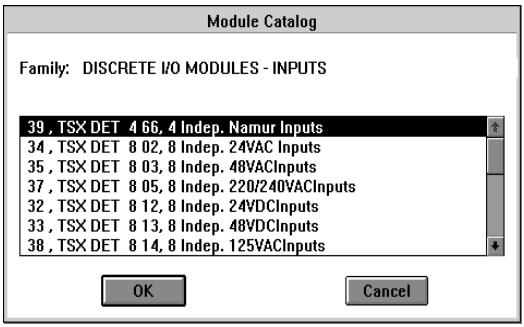
OK: Lets the user access the selected family of modules.



OK: Confirms the module selection and displays it in the Reference fields in the Module Configuration screen.

Cancel: Returns the user to the Module Configuration screen without making any changes.

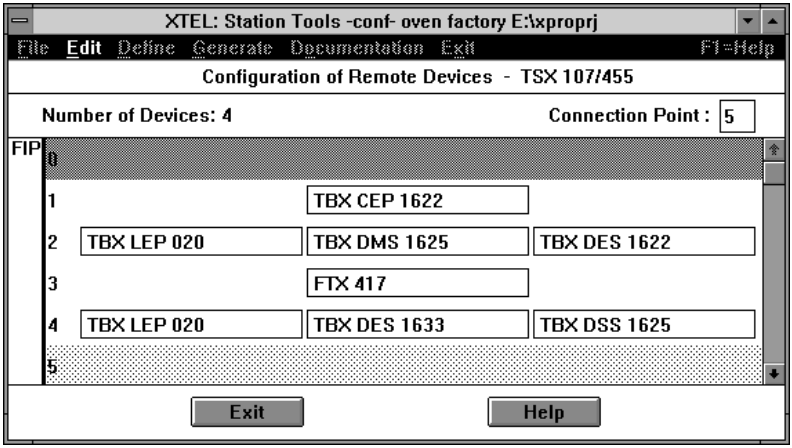
1.6-2 Remote I/O Configuration Function

Various types of devices can be connected to the FIPIO bus (TBX I/O modules, FTX PC compatible terminals, ATV speed drives, XBT operator consoles, etc.).

XTEL-CONF is used to describe the type of device present at each connection point and its parameters, where necessary.

First function window

This screen can only be accessed if the processor declared in the rack I/O configuration has a built-in FIPWAY interface. It allows the user to define the devices in a TSXV5 or PMXV5 station that are connected to a FIPIO bus.



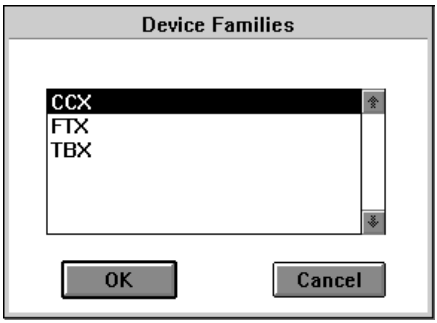
This screen is split into a number of fields that are numbered from 0 to 63. Each field represents a FIPIO bus connection point and can be used by a connected device, except for fields 0 and 63 that are respectively reserved for the PLC and a privileged terminal.

The data in each field can be modified, but not the on-screen presentation and the connection point number.

The <Del> key will delete the configured device after first prompting the user to confirm the action.

Defining a device type for a connection point:

- Place the light grey selection band on the connection point to configure, by clicking on the field or by pressing the Cursor <Tab> and <↑> <↓> keys. The dark grey fields are those that are reserved and cannot be accessed:
  - Field 0 : Reserved for the PLC
  - Field 63: Reserved for the priviledged terminal
- Double clicking on the selected field or pressing <Enter> displays a dialog box allowing the user to select a family of devices to connect.



- Select a family of devices by clicking on it or pressing the Cursor <Tab> and <↑> <↓> keys.

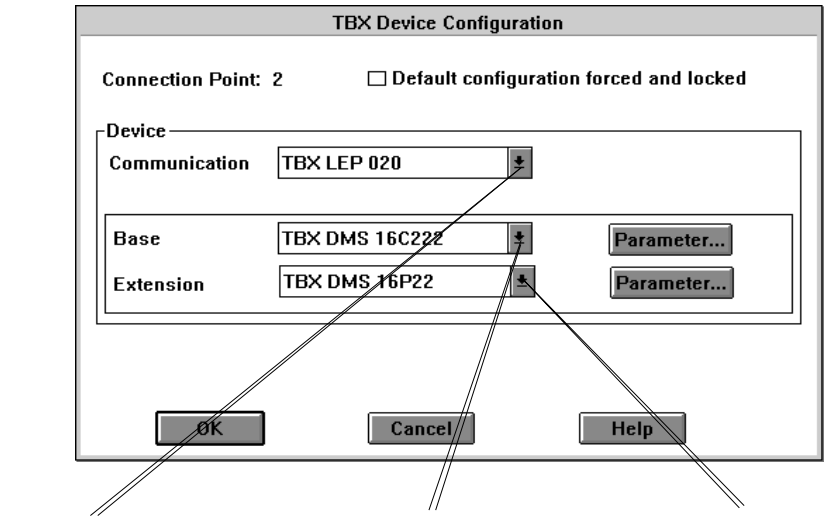
OK: Displays the device configuration screen for the previously selected connection point.

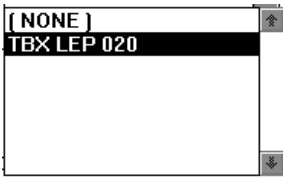
Configuring a device

The device configuration procedure is specific to each selected device type (refer to the example for TBX remote I/O modules in the next section).

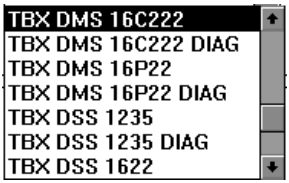
1.6-3 Configuring TBX Discrete I/O

Selecting a TBX remote I/O system displays the dialog box shown below. The user enters the catalog reference for the module in the case of a single unit TBX system or for the modules in the case of a modular TBX system (communication, base and any extensions used).

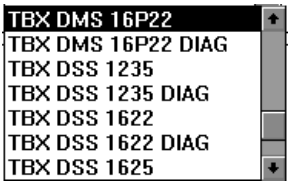




Select communication module



Select basic module



Select extension module

A device is shown by a screen that displays three types of information:

- The connection point (previously selected, this cannot be modified),
- A selection box for loading the default parameters into the module and for inhibiting access to the parameter entry screens,
- The Device information where the user can enter the module references in three fields:

  Communication field: Defines the communication module used with a modular TBX system,

  Base field: Defines the basic module used with a single or modular TBX system (1),

  Extension field: Defines the extension module (when used) for a modular TBX system (1).

(1) The DIAG indication after the reference of a modular TBX system indicates an option allowing these TBX systems to be accessed via SYSDIAG.

Button action

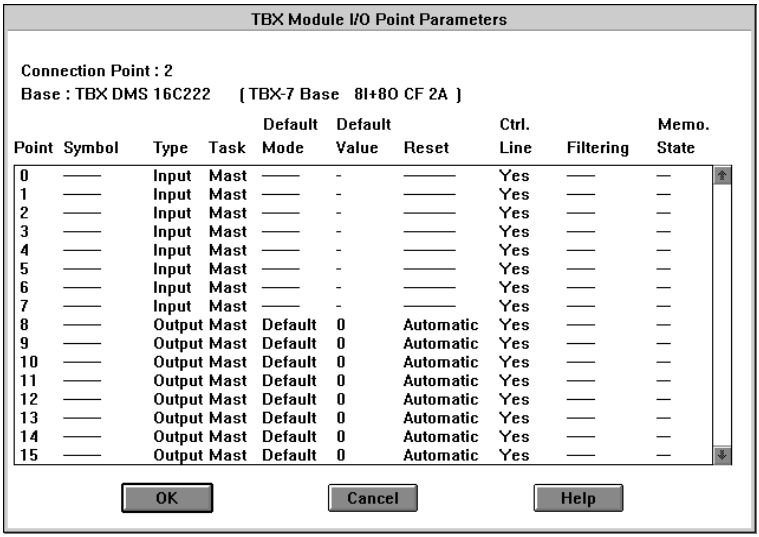
Parameter	**:**	Calls-up the parameter entry screen described above.
OK	**:**	Confirms the entries made during the current session.
Cancel	**:**	Cancels the entries made during the current session.

Selecting TBX Discrete I/O parameters

The user can select the parameters of the I/O points of a TBX Discrete I/O module. The I/O point parameter entry screen is a table where each line represents a module I/O point and each column an I/O point parameter. Parameter selection is made individually or for a set of I/O points. All of the parameters take either a default value or no value depending on the type of I/O point. The currently selected I/O point is shown by a reverse video highlight and parameters that are not present for an I/O point are shown with a line and cannot be modified.

There are various types of parameters:
- Those that only apply to inputs: filtering and memo. state,
- Those that only apply to outputs: default mode and value, reset,
- Those that apply to both inputs and outputs: task and ctrl. line.

Some parameters apply to a:
- Single I/O point (type, default value, ctrl. line and memo. state),
- Group of I/O points (type, default value, ctrl. line and memo. state).



Parameter description

Type Defines the type of I/O point (input or output) only for programmable TBX modules. The default type of I/O point is input.

Task Defines the task (FAST, MAST, AUX, etc.) that controls a group of I/O points. Default setting = MAST.

Default Mode This parameter only applies to outputs and it can only be changed or a group of points. It can take the values "hold" or "default". The usual setting is "default" set to the value 0.
-Hold: The output retains the state that it had when the failure occurred,
-Default value 0: The output goes to 0 when a failure occurs,
-Default value 1: The output goes to 1 when a failure occurs.

Default Value This parameter only applies to outputs and it is only enabled if failure mode is selected. It can changed for each point and can take the values 1 or 0. Default value = 0.

Reset This parameter only applies to outputs and it can only be changed for a group of points. When an output is disabled on failure, it must be reset before it can become active again. Reset can be automatic or controlled. Default value= automatic.

Ctrl. Line This parameter applies to both inputs and outputs and it is changed point by point. When active (yes), it checks that the wire between the sensor or actuator is not broken or shorted. Default value = yes.

Filtering This parameter only applies to inputs and it can only be changed for a group of points. It allows normal (5.7ms) or fast filtering (0.7ms). Default value = fast filtering.

Memo. State This parameter only applies to inputs and it is changed point by point. It saves all positive pulse that last more than 2 ms. Default value = Memo. State enabled.

Symbol entry can only be performed using XTEL-SDBASE to fill-in the Symbols column.

Actions allowed

Selecting one or more I/O points

To access I/O point parameters, double click on the I/O point (or press the <Tab>, cursor and <Enter> keys).

It is also possible to make multiple selections and to assign parameters to more than one I/O point at a time.

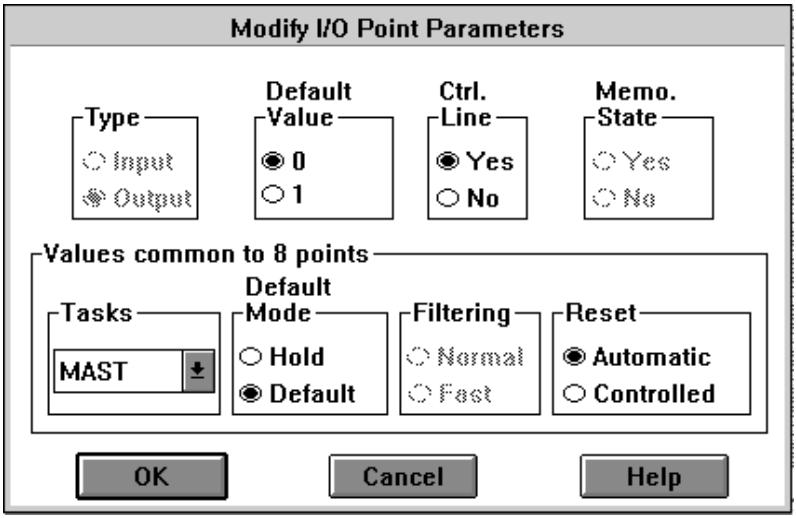
Multiple selections:

- For consecutive I/O points: Press and hold down the <Shift> key while making the selections or click and hold down the mouse button while dragging the mouse cursor to the last I/O point to select.
- For non-consecutive I/O points: Press and hold down the <Ctrl> key while making the selections.

<CTRL> / : Selects all I/O points,
<CTRL> \ : Cancels the selection of all I/O points.

Modifying the parameters of the selected I/O point(s)
Pressing <Enter> or double clicking on the selected I/O points displays the Modify I/O Point Parameters screen described below.

Modifying the parameters
Parameters are modified from the Modify I/O Point Parameters screen which comprises a succession of and radio buttons, except for the Tasks field that comprises a hidden list. This screen displays the values of the parameters for the various I/O points to modify. If the modified parameters apply to a group of I/O points, all of the I/O points in the group will be modified.



Parameters are modified using the:

Keyboard : <Tab> moves the cursor onto the parameter,
<↓> <↑> select the parameter value.

Mouse : Click on the required parameter value. To select the task, click on the arrow in the grey part to display a list of tasks available, then make a selection.

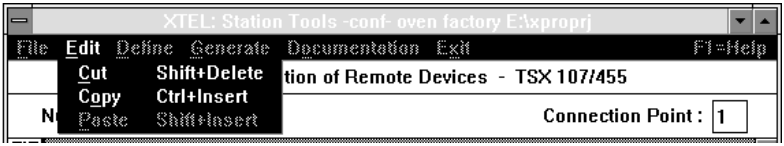
OK: Confirms the selections made during the current session,
Cancel: Cancels the entries made during the current session.

Note:

- If Input points are selected, entry fields that only apply to Outputs cannot be accessed (they are dimmed on-screen). For example, Reset or Default Value),
- If Output points are selected, entry fields that only apply to Inputs cannot be accessed (they are dimmed on-screen). For example, Filtering or Memo. State,
- If Input and Output points are selected, only those entry fields that apply to both Inputs and Outputs can be accessed. For example, Task and Ctrl. Line).
- All of the parameters that can be accessed but whoose boxes have not been ticked are not modified when the screen is confirmed.

1.7 Edit Menu

This menu is accessed from the Rack I/O and Remote I/O configuration screens and lets the user access three functions: **Cut, Copy and Paste** a rack or a remote I/O device.



Cut

This action copies the element selected by the cursor to the clipboard and deletes it from the configuration. This action can be followed by a Paste action.

Keyboard: Select the element to cut using the cursor keys <Ø> <≠>,
Cut the selected elements by pressing <Shift><Del>.

Mouse : Select the element to cut by clicking on it,
Select the Edit menu and click on Cut.

Copy

This action copies the element selected by the cursor to the clipboard without deleting it from the configuration. This action can be followed by a Paste action.

Keyboard: Select the element to copy using the cursor keys <Ø> <≠>,
Copy the selected elements by pressing <Ctrl><Ins>.

Mouse : Select the element to copy by clicking on it,
Select the Edit menu and click on Copy.

Paste

This action copies the contents of the clipboard to a location selected by the cursor. The clipboard must already contain an element previously cut or copied.

Keyboard: Use the cursor keys <Ø> <≠> to place the cursor where the element should be pasted,
Paste the contents of the clipboard by pressing <Shift><Ins>.

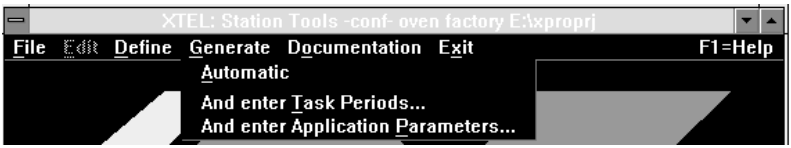
Mouse : Click on the location where the element will be pasted,
Select the Edit menu and click on Paste.

Any actions that cannot be accessed at a given time are dimmed. This is the case for the Paste action when there is nothing in the clipboard to paste.
The Cut and Paste actions can only be accessed when the cursor is placed on a significant field such as a:
Configured rack when the rack configuration screen is selected, or
Configured device when the remote I/O configuration screen is selected.

1.8 Generate Menu

Once the configuration parameters are entered from the Define menu, the Generate menu lets the user:

- Enter task periods and generate configuration binary files and the application --> function structure **and enter Task Periods...,**
- Define the size and the type of memory cartridge and generate configuration binary files and the application --> function structure **and enter Application Parameters...** In exceptional cases, when this function is performed automatically by the program, the can build the application structure (refer to the Appendix, Sub-section 1.9).
- Generate configuration binary files and the application --> **Automatic** function structure.
  This function should generally be used after any modification to the I/O configuration when the task periods or the type and size of the memory cartridge are unchanged (it can also be used when the first generation is performed, if the default values are adequate).



Note:

> After each modification made to the I/O configuration and followed by a generation, it is necessary to assign each dedicated function to the new configuration (for PL7-3 for example, select <V5 Conf.> to take into account the newly generated configuration.

1.8-1 Automatic Generation

In this case the files are generated when the "automatic generation" action is selected. The system will automatically determine the configuration binary files to generate depending on the configuration set by the user.
The task periods, the type and size of the memory cartridge taken into account are those defined the last time the configuration was generated or the default ones (Master task at 50ms and no memory cartridge configured).
The memory layout is determined automatically.

1.8-2 Generate and Enter Task Periods

This function lets the user access a screen enabling definition of the scan time for application periodic tasks.

These include: Fast task FAST, Master task: MAST,
Auxiliary tasks: AUX0, AUX1, AUX2, AUX3. The number of auxiliary tasks (2 or 4) depends on the type of PLC processor.

The master task is always configured, regardless of the type of PLC processor or the application. Its default period value is 50 ms and it cannot be deleted.

The auxiliary tasks must be configured in rising order (AUX0, AUX1, AUX2, AUX3), and deleted in decending order AUX3, AUX2, AUX1, AUX0).

By default, only the master task is configured, the other tasks have a scan period of 0 ms.

The task scan period values are:

- Fast task: 0 or from 1 to 255 ms in values that are a multiple of 1 ms,
- Master task: From 1 to 255 ms in values that are a multiple of 1 ms,
- Auxiliary tasks: 0 or from 10 to 2550 ms in values that are a multiple of 10 ms,

Task period coherence
When the task periods are defined, they must follow the task priority order with the Master task as the reference period.

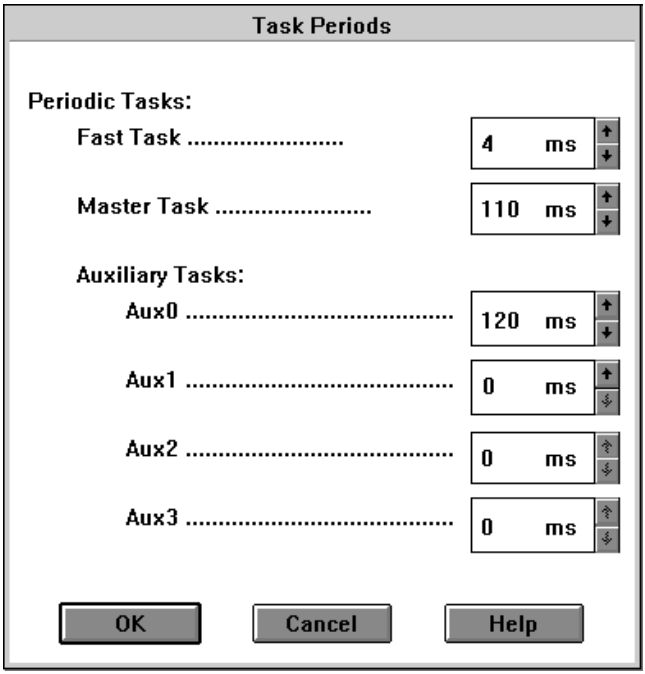
The task periods must be defined according to the following principles:

PF < PM < PAi

PF = Period of FAST task
PM = Period of MAST task
PAi = Period of Auxiliary tasks (i = 0, 1, 2, 3)

A coherence check is performed by the system to ensure that these rules are followed.

Task Periods definition screen



Task period modification

To modify the task periods, proceed as follows:

- Keyboard : Press <Tab> to move the cursor within the various fields,
  <↑> increments the period value,
  <Page Up> increments the period value by 10 or 100,
  <End> displays the highest value,
  <↓> decrements the period value,
  <Page Dn> decrements the period value by 10 or 100,
  <Home> displays the lowest value.
- Mouse : Click on the up arrow to increment the period value,
  Click on the down arrow to decrement the period value.

Button action

OK: Confirms the entries made during the current session and starts binary file generation.

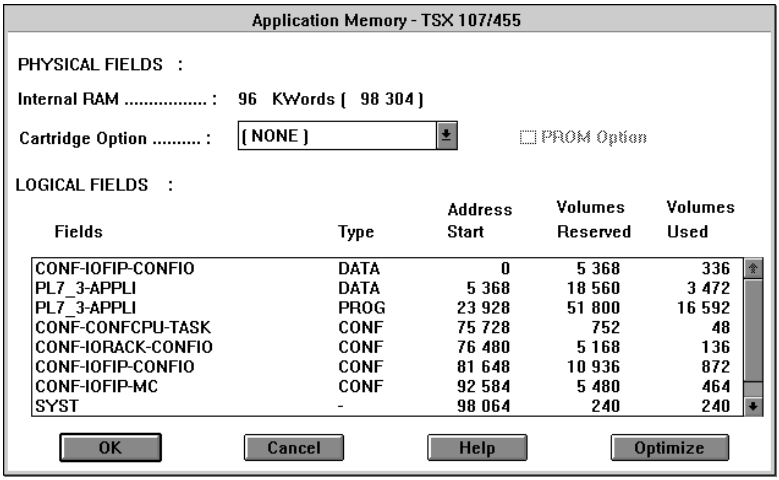
Cancel: Cancels the entries made during the current session and returns the user to the XTEL-CONF primary window.

1.8-3 Generate and Enter Application Parameters

This action lets the user select the size and type of memory cartridge to use. It also allows access to modification of logical memory fields (data and program). The Optimize button starts automatic memory field structuring.

This screen comprises two fields:

- A description and entry field for physical fields,
- A description and entry field for logical fields.

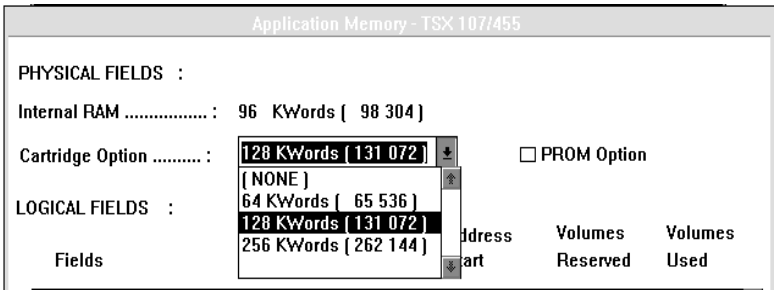


1- Modifying the physical fields

In the PLC, the application is split between two physical fields:

- Internal RAM which cannot be modified and depends on the configured PLC processor,
- Memory cartridge.

Modifying the presence and the size of the memory cartridge



To modify the presence and the size of the memory cartridge, select the "Cartridge Option" field.

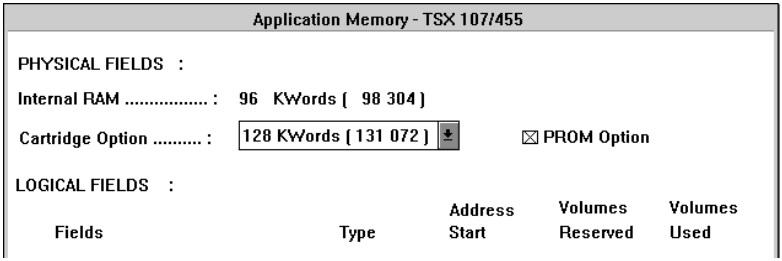
• Keyboard : Press <Tab> to place the cursor on the field,
<↑><↓> toggle cartridge presence on or off (display shows cartridge size or "None").

• Mouse : Click on the arrow at the far right of the field to display the list of cartridges availables and to allow selection of a cartridge type by clicking on it.

If the cartridge size is increased or reduced, the user can simply reorganize the assignment of memory fields, automatically using the Optimize command.

Modifying the PROM option

To modify the PROM option, toggle selection of the PROM option on or off. If no memory cartridge is defined, the PROM option cannot be selected.



• Keyboard : Press <Tab> to move the cursor onto the field,
Press the <Spacebar> to toggle selection on or off,

• Mouse : Click on the box.

Selecting the PROM option lets the select a memory layout that from the time the application is created, supports changes in the type of PLC memory cartridge (RAM/ PROM). When this option is selected, the DATA field that cannot be stored in PROM are always located in the internal RAM and the PROG and CONF field that can be stored in PROM are located in the memory catridge field.
An application where the PROM option is selected can be stored in a PROM at any time using the "PROM Programmer". If this option is not selected, the application will expand to take up the all of the memory space, leading to PROG storage in internal RAM and DATA in the memory cartridge.

2- Modifying logical fields

Optimize button

This function distributes the logical fields within the physical memory field according to preset criteria. Optimization only changes the reserved sizes and the start addresses. This ensures that a correct configuration is obtained. If the PROM option is selected, the sum total of the reserved volumes that can be stored in a PROM must not exceed the size of the memory cartridge and the sum total of the reserved volumes in fields that cannot be stored in PROM must not exceed the size of the internal RAM available in the PLC processor. If this is not the case, an error message is displayed and optimization is not performed.

Remark:

> Modification of physical fields can also be performed manually (refer to Sub-section 1.9).

3- Validating modifications

OK button

Validates the entire screen. The coherence checks on the various entries made are performed at this point:

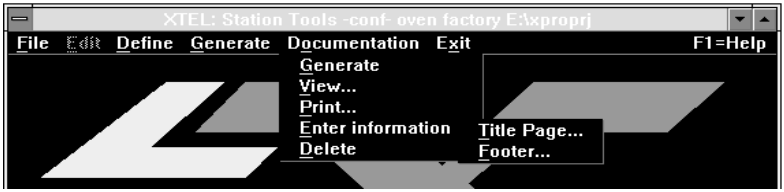
- Coherence check on the volumes reserved and the volumes used in the functions field,
- Coherence check between the physical volume available and the volume taken by the fields: the total volume of the logical fields must be less than the memory cartridge volume + Internal RAM,
- Position check on the station descriptor that must be located at the end of the memory field so that it can be found by the PLC program,
- Check, when the PROM option is selected, to ensure that no DATA field is stored in the memory cartridge and that no PROG field is stored in the internal RAM.

If an incoherence is found, a message is displayed and the application structure file is not built. XTEL-CONF performs a diagnostic on the incoherences found but does not correct problems caused by memory overlapping. The user must select the appropriate tool to correct the errors found.

1.9 Documentation Menu

This menu lets the user access a number of functions for:

- Generating the documentation file,
- Accessing the documentation file screen,
- Printing the documentation file,
- Entering information for:
  - The title page,
  - The footer.
- Deleting the documentation file.

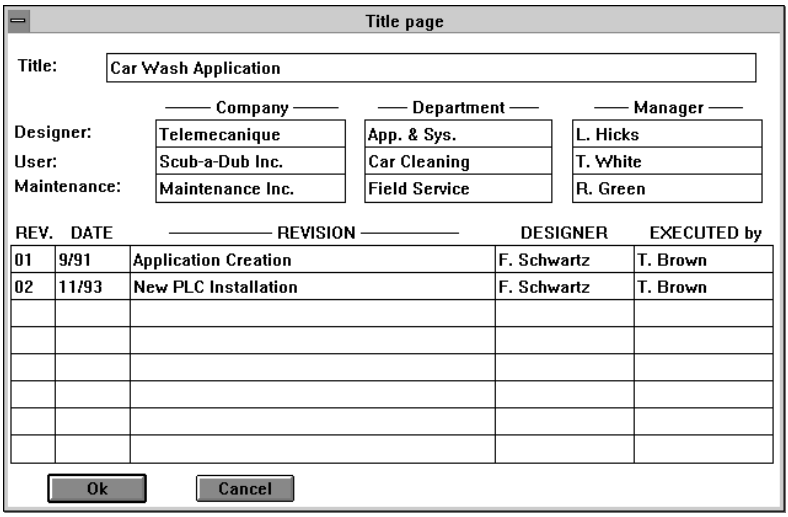


D

1.9-1 Entering Title Page and Footer Information

- Entering title page information

When this menu is first selected, the entry fields contain the contents of the Title Page file if it already exists. Otherwise they are blank.
The user can access a preset field with the mouse or the <Tab> key. Within the same field, the columns and lines are accessed with the mouse or cursor keys.



The various possible entries are:

- TITLE :Application title (64 chars. max.),
- COMPANY :Company Name (16 chars. max.),
- DEPARTMENT :Department Name within the Company (16 chars. max.),
- MANAGER :Manager's Name (16 chars. max.),
- REV. :Project revision level (3 chars. max.),
- DATE :Project creation or modification date (8 chars. max.),
- REVISION :Project revision description (32 chars. max.),
- DESIGNER :Designer's Name (12 chars. max.),
- EXECUTED BY :Programmer's Name (12 chars. max.).

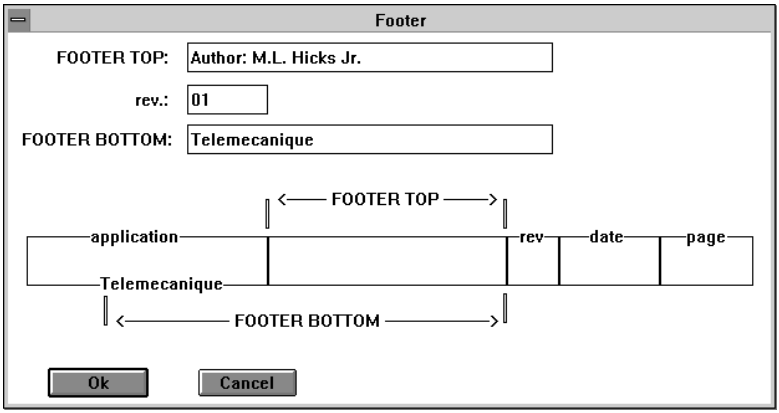
OK Saves the screen to the Title Page file and lets the user exit the screen,

Cancel Cancels the screen and lets the user exit without saving the Title Page file.

- **Entering a custom footer**

This screen lets the user customize the footer that appears at the bottom of the documentation file. Two character strings can be customized by the user:

- A string of 25 characters at the top of the footer,
- A string of 3 characters for the revision level,
- A string of 45 characters at the bottom of the footer.



The various fields display the contents of the Footer file if it already exists.
The footer provides the following information:

- Application name,
- Name of the section printed,
- Document version number,
- Date of the print-out,
- Page numbering within each section,
- Absolute page numbering.

OK Saves the screen to the Footer file and lets the user exit the screen,

Cancel Cancels the screen and lets the user exit without saving the Footer file.

1.9-2 Generating the Documentation File

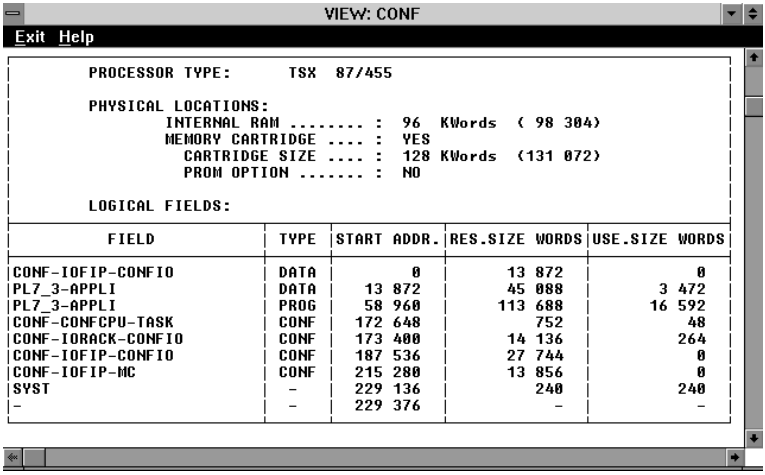
Once all the configuration information, the title page and the footer have been entered, the Generate action will generate the documentation file for the application.

After each modification made to the configuration, the title page or the footer, the user must select the Generate action for the documentation file update to become effective.

The documentation file applies to the last configuration generated. To take into account the modifications made to a configuration, the configuration files must be saved by a Generate action.

1.9-3 Viewing the Documentation File

This function displays the documentation file on-screen. Using the scroll bars, the user can display all of the documentation file headings.

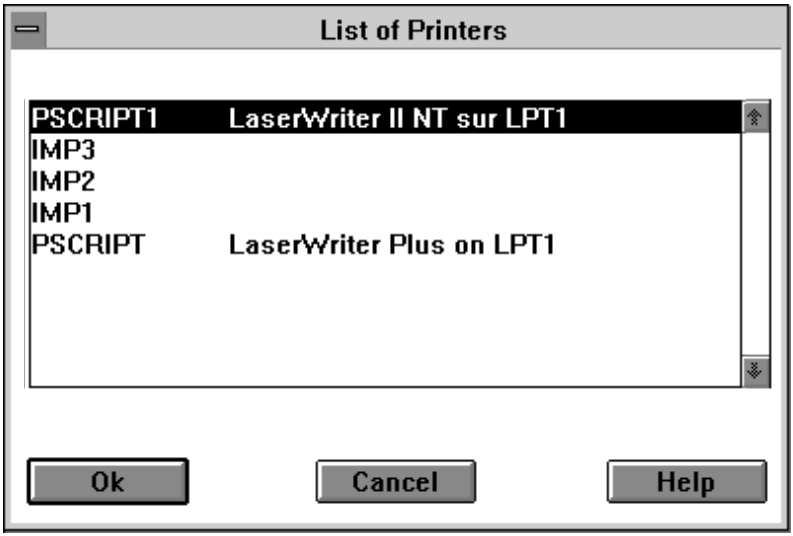


FIELD	TYPE	START ADDR.	RES.SIZE WORDS	USE.SIZE WORDS
CONF-IOFIP-CONFIO	DATA	0	13 872	0
PL7_3-APPLI	DATA	13 872	45 088	3 472
PL7_3-APPLI	PROG	58 960	113 688	16 592
CONF-CONFCPU-TASK	CONF	172 648	752	48
CONF-IORACK-CONFIO	CONF	173 400	14 136	264
CONF-IOFIP-CONFIO	CONF	187 536	27 744	0
CONF-IOFIP-MC	CONF	215 280	13 856	0
SYST	-	229 136	240	240
-	-	229 376	-	-

Exit: Lets the user exit the documentation file view screen.

1.9-4 Printing the Documentation File

The Print action displays a dialog box that lets the user display the printer to use for printing out the documentation file.



OK : Starts printing to the selected printer,

Cancel : Cancels printing.

1.9-5 Deleting the Documentation File

The Delete action deletes documentation file from the hard disk after first prompting the user to confirm the deletion.

1.10 Appendix

This appendix is intended for those users who prefer to build their own memory structure for the application.
Users are reminded that XTEL-CONF will automatically perform this operation and that manual memory mapping is a delicate procedure requiring a good working knowledge of the application memory structure.

1.10-1 Memory Structure

The various fields are automatically distributed across the entire declared memory field according to the principles described below:

- **Variable fields**:
  - The fields reserved for dedicated functions (DATA, PROG.) are distributed by quotas and can be modified by the user.
  - The fields reserved for the configuration (DATA, CONF.) are set by the program depending on configuration parameters and can be modified by the user.
- **Fixed field:** The system field (SYST.) is defined by the program and cannot be modified by the user. This required field is calculated according to the dedicated functions used.

The user retains the possibility of adjusting the fields according to requirements. The program performs a coherence check on the data, to ensure that the system field (station descriptor) is located at the end of the memory space. In addition, when an EPROM cartridge is used, the data fields are located in internal RAM and the PROGRAM, CONFIGURATION and SYSTEM fields are located in the cartridge.

This memory map can be transferred to the PLC, its memory being considered physically "formatted" and therefore usable by the various dedicated functions that can access their respective reserved fields.

Memory Field Allocation

Variable field reserved for dedicated functions	PL7-3 DATA
	PL7-3 PROGRAM
	PL7-X DATA
	PL7-X PROGRAM
Variable field reserved for the application configuration	DATA Configuration
	CONF. Rack I/O
	CONF. FIPIO Bus I/O
	CONF. Tasks
	CONF. Bus Controller
Fixed field	Station Descriptor (SYST.)

Memory Field Allocation
Internal RAM/Cartridge

Internal RAM	Configuration Data
	PL7-X Data
	PL7-3 Data
EPROM Cartridge	PL7-3 PROGRAM
	PL7-X PROGRAM
	CONF. Rack I/O
	CONF. FIPIO Bus I/O
	CONF. Tasks
	CONF. Bus Controller
	Station Descriptor (SYST.)

D

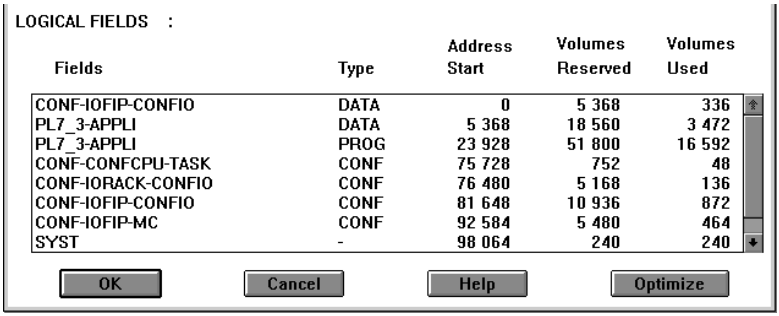
1.10-2 Modifying Physical Fields

This is performed using the **and enter Application Parameters...** action selected from the Generate menu (refer to Sub-section 1.7-3).

The table that describes the logical fields comprises:

- For each function in the station, the type of field: Data (DATA), Program (PROG),
- The fields reserved for the configuration (CONF),
- The start address in relation to the addressable field,
- The reserved space,
- The usable space (information provided by the .BIN file).

The field reserved for the system must always be located at the end of the application memory field. Its size is variable, depending on the number of functions and the fields defined for the station.



Possible modifications include:

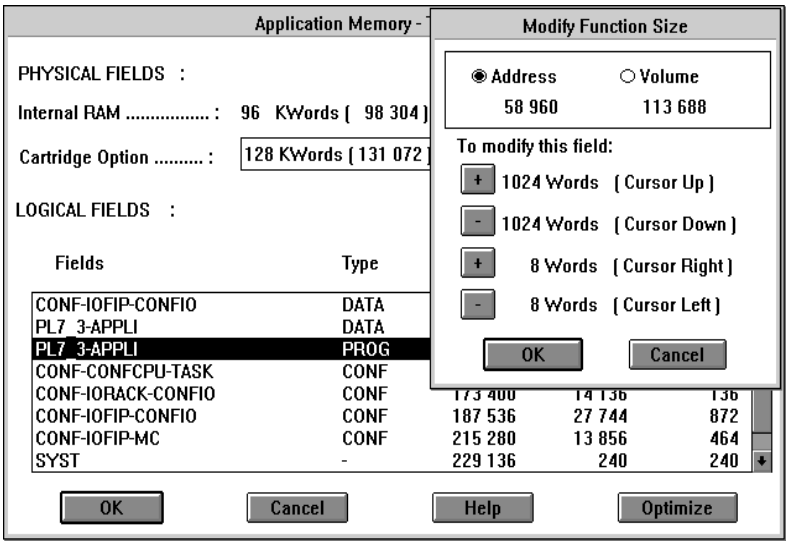
- Moving a field (moving a field that can be stored in PROM from the internal RAM to the PROM cartridge, for example),
- Increasing the reserved field size (by increasing the address value of the next field or by reducing the address value of the current field),
- Reducing the reserved field size (by reducing the address value of the next field or by increasing the address value of the current field).

Remarks:

- The user can change the various screen fields separately.
- If the selected binary files are too large, the minimum configuration will not accept the logical fields. The user must then selelect an adequate hardware configuration.

Modifying a start address or the reserved size

To modify a start address or the reserved size, the user should select the appropriate field (the currently selected field is highlighted in reverse video). To select a field, click on it (or press <Enter>) and a data entry sub-window is displayed. This window displays the value of the current field and lets the user modify it.



Select the type of modification to make: Address or Volume.

In the menu that contains the value to modify, a message prompts the user to use the arrows to change the settings displayed. The possible values are displayed in the current field. It is also possible to modify these values using the cursor keys:

- Cursor Up/Down: fast change in K word (1024 words) increments,
- Cursor Left/Right: slow change in 8 word increments.

Modifying a group of memory fields:

It is also possible to simultaneously change a group of adjoining fields in memory. To do this, click on the first field to modify then press <Shift> or <Spacebar> while clicking on the last field to modify. The selected fields are displayed in reverse video. The rest of the procedure is the same as that described for the address of a single memory field. Multiple selections can also be made using the mouse, by clicking on the first element and holding down the mouse button until the last element is selected.
<CTRL>\: Cancels the selection of all lines.

OK Button: Confirms the modifications made (refer to Sub-section 1.7).

D

2.1 Presentation

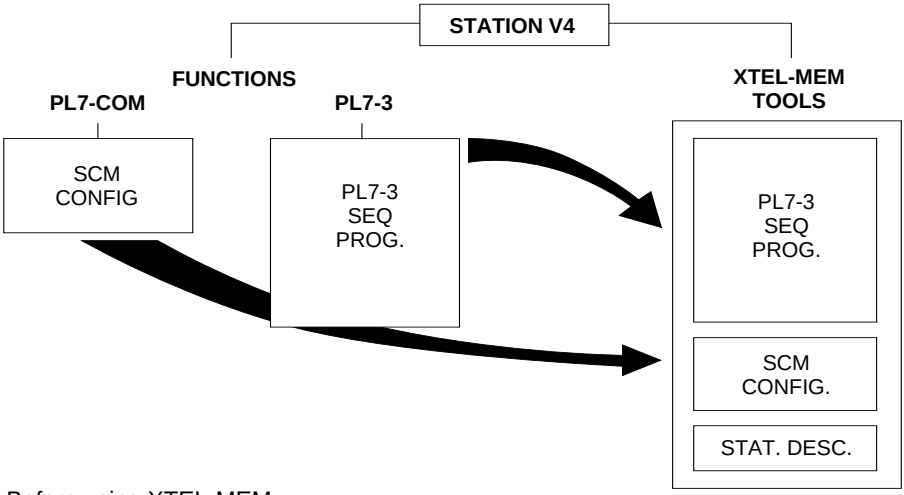
XTEL-MEM is designed to create a program that can be executed by the PLC using the binary codes generated by the various dedicated programs, e.g. PL7-3, PL7-COM, etc. XTEL-MEM runs in the Software Workshop and can access the binary codes generated by the various dedicated applications to integrate them into the complete and final application.

The functional breakdown shown below only applies to the TSX and PMX Model 40 ranges:

- Sequential programming of PLCs : PL7-3, PL7-3 GLD/GLT
- Axis control programming : PL7-AXE,
- Communication module programming : PL7-COM,
- Analog input module programming : PL7-PCL,
- PMX process control system programming : PL7-PMS,
- Man-machine interface programming : PL7-MMI,

To these dedicated functions a field reserved for routing must be added when multiple network applications are used, i.e. for Bridge stations.
XTEL-MEM is only used with TSX Series 7 V4 PLCs.

Station memory layout diagram:



Before using XTEL-MEM:

- **With X-TEL**: The user must define the dedicated tools that will be used by the Station. If this phase is skipped, the tool will not be able to correctly define the various fields required by the dedicated functions. Any change in the tools used requires remapping of the memory fields.

- **With MINI X-TEL**: The user must ensure that all of the dedicated tools that will be used to develop the application are already installed.

Remark

If one or more dedicated functions are installed in MINI X-TEL, and are not used in the development of the application, they will be taken into account by XTEL-MEM when it maps the memory.

Supported functions

- XTEL-MEM supports functions used during the design and integration phases of an application:
  - PLC processor type selection,
  - Memory mapping definition,
  - Binary code integration and chaining when creating or modifying an application,
  - Elaboration of the associated on-line files,
  - Binary code version management.
- In addition, XTEL-MEM lets the user:
  - Extract the binary code of the various functions that make up the application from the stored application file,
  - Integrate the binary code of a function into an application file. When this is done, only binary code from functions declared when the application file was created can be integrated, up to the limit of the available assigned memory space.

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2.2 Features

2.2-1 PLC Selection - Memory Mapping Definition

This phase defines the application envelope. In practice, the tool creates a file that contains no binary code, only the memory layout.

XTEL-MEM creates a file called xxxx.APP

This file is generated from data describing the selected PLC and the application being designed:

- **PLC type: Select one from the 10 choices available for a TSX V4 station, Select one from the 15 choices available for a PMX V4 station,**
- **If required, the size and type of memory cartridge,**
- Memory fields of the various functions used.

The program will offer to optimize memory mapping where the various fields are automatically distributed across the entire memory space declared, using the following principles:

- **Variable fields** that are distributed by quota and can be modified by the user:
  PL7-3 DATA: Weight 3 PCL PROG: Weight 1
  PL7-3 PROG: Weight 7 PMS PROG: Weight 1
  COM PROG: Weight 1
  AXE PROG: Weight 3
- **Variable fields** that are set by the program and can be modified by the user:
  MMI DATA: 8 Kwords (8192 words)
- **Fixed fields** that are defined by the program and cannot be modified by the user:
  MMI PROG: 64 words BRIDGE: 256 words
  The system field (SYST) is mandatory and its size is calculated according to the dedicated functions selected.

Example 1: In a station with 48 Kwords (49,152 words total) of on-board RAM only, an analysis of requirements leads to the use of PL7-3 and PL7-COM tools.
Program optimization is performed as follows:

- Memory assigned to the user: 49,152 words - System,
- Sum total of quotas: PL7-3 + Com. Prog 3+7+1=11.

The user memory will be automatically distributed as follows

- PL7-3 Data 49,152 **-** Syst x 3/11
- PL7-3 Prog.49,152 **-** Syst x 7/11
- Com. Pgm. 49,152 **-** Syst x 1/11

Example 2: In a station with 48 Kwords (49,152 words total) of on-board RAM only, using PL7-3 and PL7-MMI tools.Program optimization is performed as follows:

- **Memory assigned to the user**:
  = 49,152 words - MMI Prog. - System,
  = 49,152 - 64 - Syst,
  = 49,088 - Syst.
- Memory assigned to MMI Data: 8,192 words.
- Memory assigned to PL7-3:
  = 49,088 - 8,192 - Syst,
  = 40,896 - Syst.
- Sum total of quotas: PL7-3 Data + PL7-3 Prog 3+7=10.

The user memory will be automatically distributed as follows

- MMI Data 8,192 words
- PL7-3 Data 40,896 **-** Syst x 3/10
- PL7-3 Prog.40,896 **-** Syst x 7/10

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The user always retains the ability to adjust the size of the fields according to individual requirements. The program performs a coherence check on the data to ensure that the system field (station descriptor) is located at the end of the total memory field.

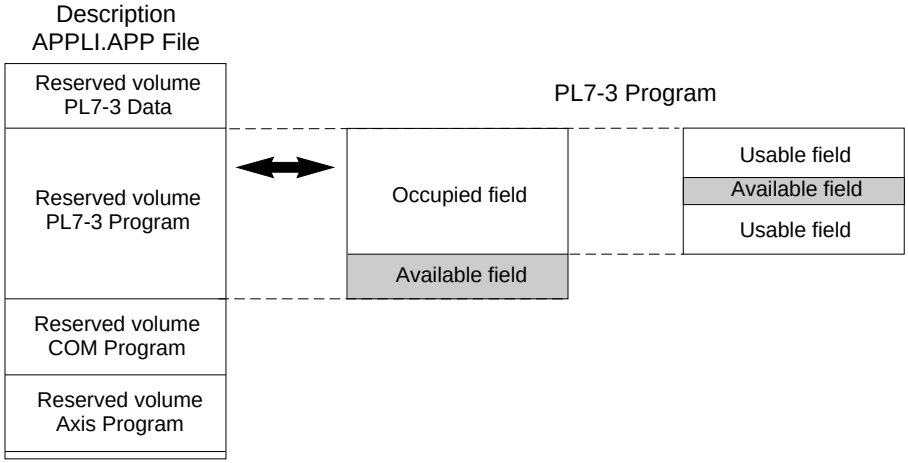
The memory mapping can be transferred to the PLC. The PLC memory is considered to be physically formatted and therefore can be used be the various dedicated functions that can access their own reserved fields.

During the design office development phase, on a single station or on a number of different stations, the xxxx.APP file that is produced is reused by each dedicated function to ensure that the size of the individually assigned fields is known to each application.

2.2-2 Binary File Integration and Chaining when Creating or Modifying an Application

This step builds the PLC program within the previously designed memory map. The various binary codes are then integrated into the xxxx.APP file in rising order of memory address:

Example:
- PL7-3 xxxx.BIN type file,
- PL7-AXE xxxx.BIN type file,
- PL7-COM xxxx.BIN type file,
- BRIDGE BRIDGE.BIN type file.



PL7-AXE and PL7-COM Functions

The .BIN files for the PL7-AXE dedicated function are created from xxx.172 or xxx.182 files. The .BIN files for the PL7-COM dedicated function are created from .COM files.

PL7-3 Functions

The binary code generated by PL7-3 takes into account the volume or the field reserved for it by XTEL-MEM. The **memory mapping can be reorganized** and the field assigned to PL7-3 reduced within the following limits (refer to the figure above):

- **The reserved field is reduced to the occupied field size.**
  Therefore no available field is left and the entire available volume is used.

- **The reserved field must be smaller than occupied field size.**
  XTEL-MEM checks if the space occupied by the PL7-3 program can be reduced and authorizes the modification if the PL7-3 program can be optimized. Otherwise the modification is refused.
  Opimization is performed by reconfiguration in the PL7-3 function. Optimization is performed by reconfiguration in the PL7-3 function.

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2.2-3 Associated On-line File Elaboration

XTEL-MEM also supports the ability to document the PLC memory mapping as configured. This information is retained in a number of files that are stored on disk or diskette.

• DATA ENTRY

The user is only required to enter the information for the Title Page and to customize the page Footer. The files generated have the same name as the .APP extension file but take a different extension.

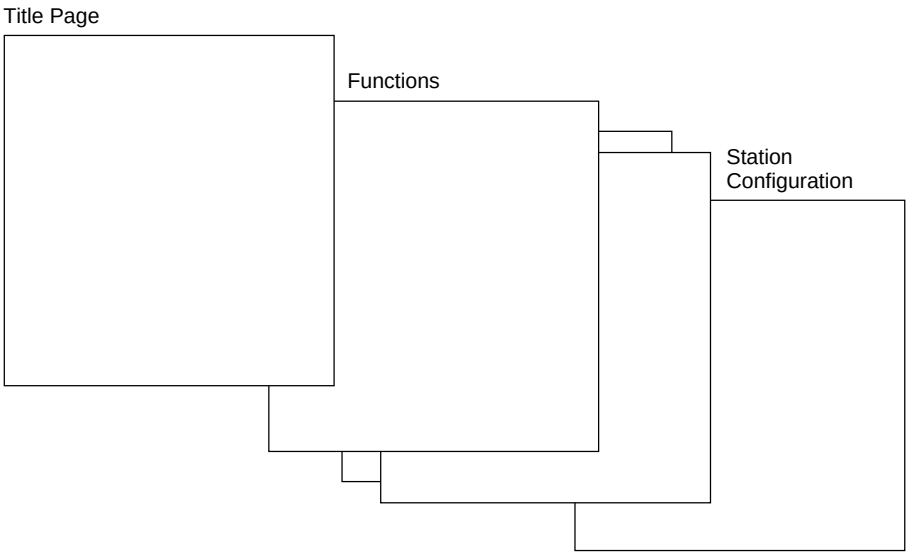
Example: For file Shop7B.APP
The files assigned on creation are:
Title page: Shop7B.TIT
Footer: Shop7B.CRT

• DOCUMENTATION FILE PRINT-OUT

The file that is generated can be printed-out on a standard or semi-graphic printer (IBM or compatible) in A4 format.
The documentation file comprises:

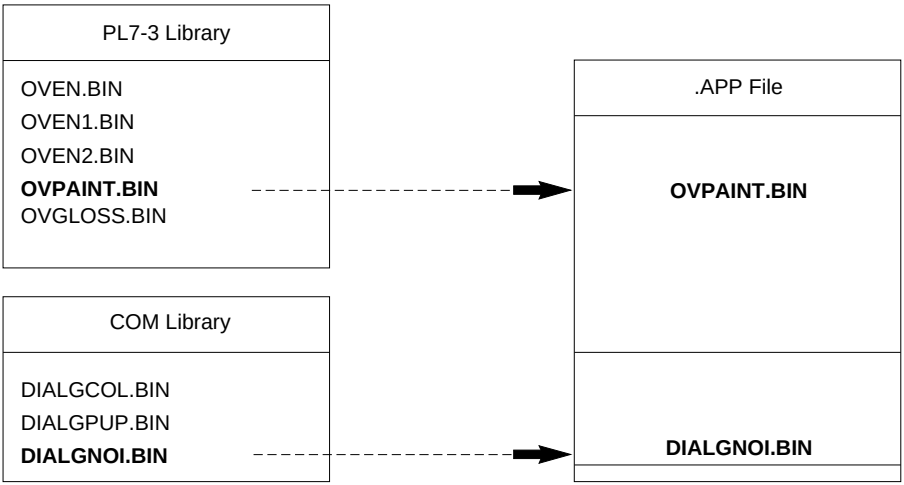
- A Title Page,
- A list of functions and station file names,
- The configuration of the station memory,
- A table of contents.

The complete documentation file is stored as xxxx.DOC.



2.2-4 Binary Code Version Management

XTEL-MEM lets the user build-up a complete automation application from existing binary files in the fields reserved for each dedicated application.



The program rebuilds the memory map of the application from the assigned binary codes. The user can also reorganize the memory fields manually by modifying the start or end of field addresses.

This breakdown into functions is the first level of the modular construction of an application by functional entity.
It allows the user to:

- Build-up the PLC program by dedicated function,
- Debug and independently modify the binary codes of each function,
- Manage the evolution (or version) levels of the .APP files.

2.2-5 Extracting a Binary File from an Application File

XTEL-MEM supports the extraction of binary files (xxxx.BIN) from application files (xxxx.APP) that may, for example, have just been transferred. This means that it is possible in each dedicated function, to recover the corresponding xxx.BIN file.

This function allows:
- Selection of the application file that binary files will be extracted from,
- Checking for each application file selected of which binary files are actually present in the mapped functions,
- Extraction of a selected binary file for storage in another file. The extracted binary file can, if necessary, be integrated into another application file (refer to sub-section 2.2-6).

2.2-6 Integrating a Binary File into an Application File

This is the reverse function to extraction. XTEL-MEM supports the integration of a function binary file (xxxx.BIN) into an application file (xxxx.APP).
This operation is performed without changing the memory mapping and can therefore only take place if the xxxx.BIN file to be integrated is compatible with the elements declared in the xxxx.APP file when it was created (processor type, memory cartridge if present, declared functions, reserved memory field larger than that actually used).

A partial update of an application file (xxxx.APP) can therefore be performed:
- Directly in XTEL-MEM (by integrating an xxxx.BIN file),
- When the modification of a binary file is completed by the corresponding dedicated program (PL7-3, PL7-AXE, etc.). In this case, when a new binary file is saved, the user is automatically prompted to allow the update of the corresponding application file.

Points to Remember about XTEL-MEM:
- **Initial application creation**
  Create an empty memory map Empty .APP File
  Generate binary files in the dedicated functions
  Integrate binary codes Definitive .APP File
- **Application modification**
  Specialized evolutions of the various binary codes
  Evolution of the .APP file that integrates the new fields
- **Reusing existing binary codes**
  Creation of the definitive .APP file with XTEL-MEM.
- **Partially updating a .APP file without changing the memory mapping**
  Integration of a .BIN file into a .APP file.
- **Extracting a .BIN file from a .APP file**

2.3 Accessing the XTEL-MEM Tool

The XTEL-MEM tool is accessed:

- In the X-TEL Software Workshop: from the Station Tools available to the user for managing a station in the X-TEL Software Workshop,
- In the MINI X-TEL Software Workshop: from the primary window.

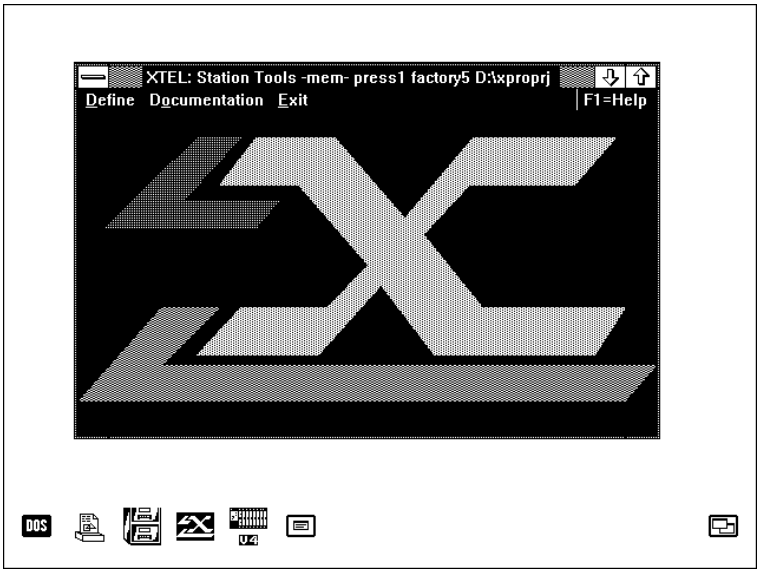
X-TEL

Select a Volume
→ Select a Project
→ Select a Station
→ Select the XTEL-MEM tool in Station Tools

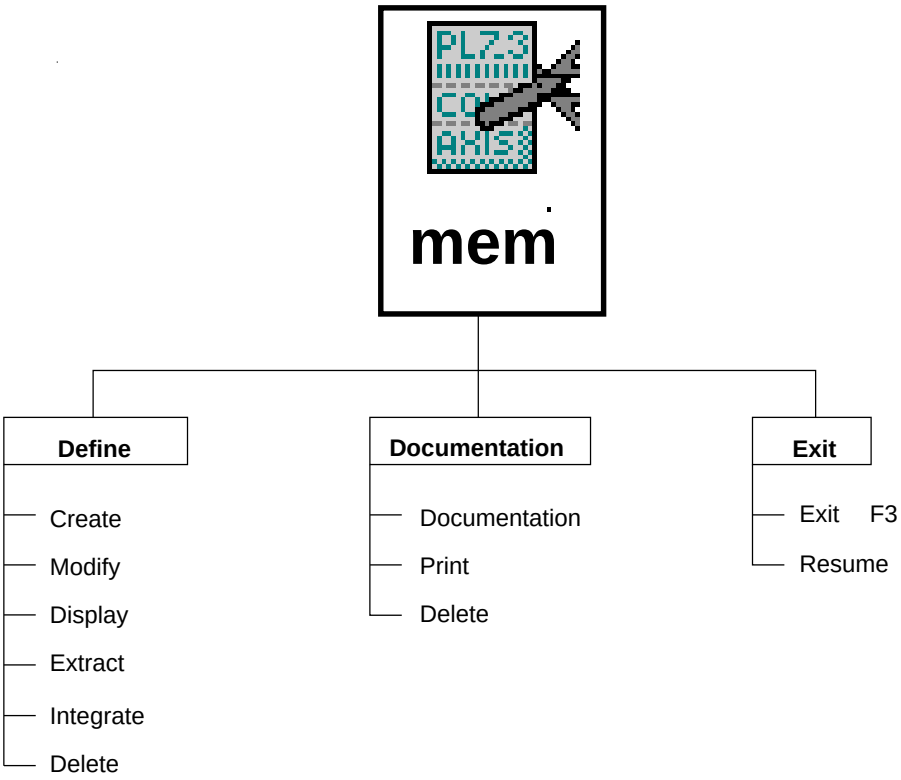
MINI X-TEL

Primary window
→ Select the XTEL-MEMtool in the primarywindow

Primary window



The primary window of the XTEL-MEM tool lets the user select an action to execute from those proposed in the three menus displayed by accessing the action bar.

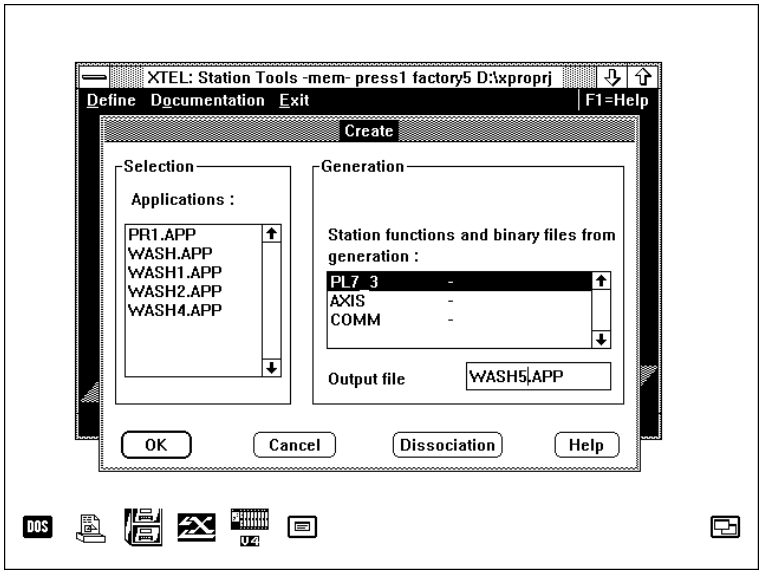

PL73
CO
AXIS
mem
Define
Create
Modify
Display
Extract
Integrate
Delete
Documentation
Documentation
Print
Delete
Exit
Exit F3
Resume

2.4 DEFINE Menu

2.4-1 Create Action

First action window

This screen is the first step in creating an .APP file. The user should enter the name of the file to create (output file) and the binary files assigned to the various functions defined for the station.



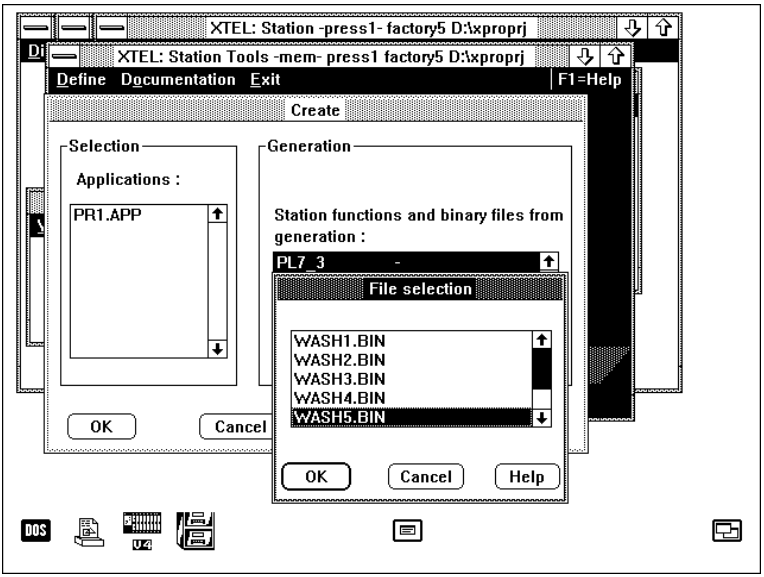
This screen comprises three data entry and display fields and four buttons.

- **Selection field (Applications):**
  This field lists the existing applications for the user's information. No selection can be made in this field.
- **Generation field (Station functions and binary files from generation):**
  This field lists all of the functions declared in the station. Opposite each function, the name of a binary file created by the action can be displayed.
- **Entry field (Output file):**
  This field lets the user enter the name of the .APP file to create. This name can take up to eight characters max. followed by the .APP extension.

- **OK**
  Lets the user move onto the second create action screen. This second screen lets the user describe the physical and logical fields of the memory,
- **Cancel**
  Cancels the create action and returns the user to the primary window. No files are created,
- **Dissociation**
  After confirmation by the user, this action cancels the association between the action and the selected binary file shown in the generate field,
- **Help**
  Lets the user access the XTEL-MEM help screens.

Selection of a file assigned to a action

To select a .BIN file that is assigned to one or more functions, select the line for the selected action and double click on this line (or press Enter).



This list of all the file created for this action is displayed. After selecting the required action, pressing:

- **OK**
  Validates the selection made. The name of the selected binary file is then displayed in the generate field,
- **Cancel**
  Cancels the file selection and returns the user to the previous screen,

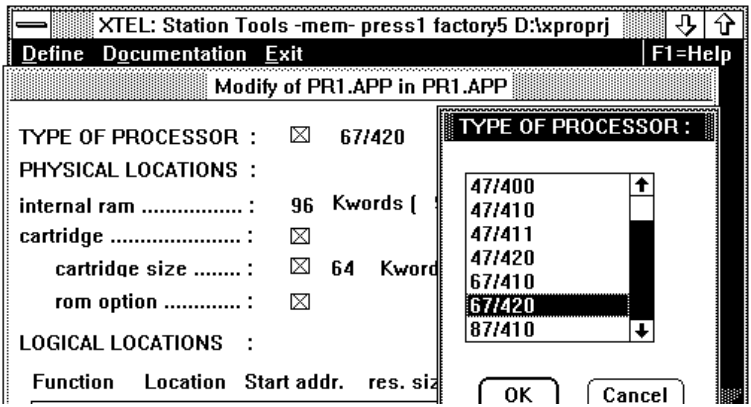
Second screen window

The second window is only displayed after the first one is validated. It lets the user define the various parameters that comprise the memory structure of a PLC.

The screen comprises three fields:
- A PLC processor type entry field,
- A physical field description entry field,
- A logical field description entry field.

1 - Selecting the PLC processor type:

To modify the type of PLC processor selected, click in the corresponding box.



This field lets the user choose from one of the following PLCs.

For a TSXV4 level station:
- TSX P47-400, P47-410, P47-411, P47-420,
- TSX P67-410, P67-420,
- TSX P87-410, P87-420,
- TSX P107-410, P107-420,

For a PMXV4 level station:
- All TSXP... PLCs,
- PMX P47-420,
- PMX P67-420,
- PMX P87-420,
- PMX P107-420.

OK

Validates the selection. The newly selected type of PLC processor and the selected amount of internal RAM are displayed,

Cancel

Cancels the selection and returns the user to the previous screen.

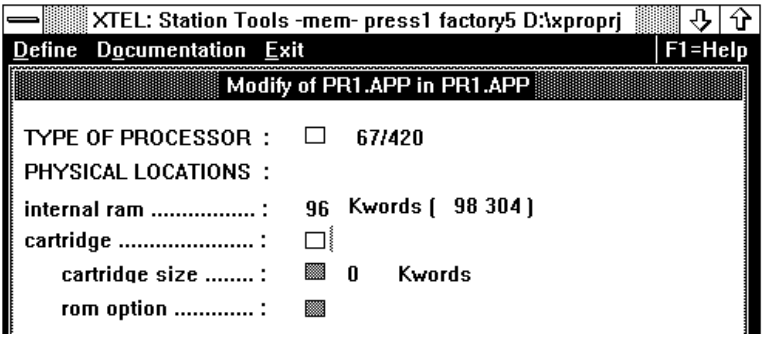
When create is selected, there are two possible cases:

- There is no binary file assigned to the PL7-3 action and the screen is displayed with the minimum PLC configuration: TSX P47-400, no hardware cartridge, 24K word internal RAM, fields assigned to each action of the station,
- There is a binary file assigned to the PL7-3 action. The PLC processor selected for initialization is the one required by the PL7-3 binary file.

2 - Modifying physical fields

In the PLC, the application is divided between the two physical fields listed below:

- Internal RAM memory,
- Memory cartridge.



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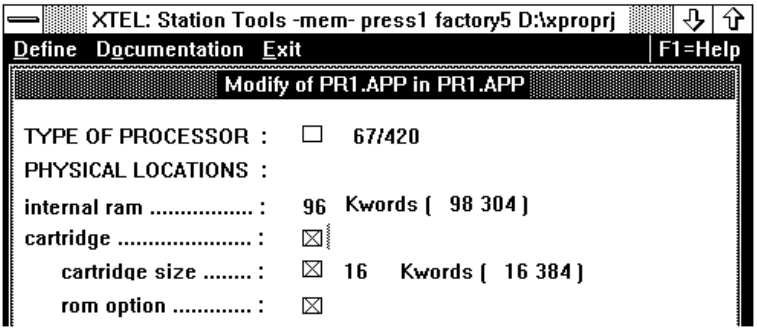
The amount of internal RAM cannot be changed, it depends on the type of PLC processor selected.

Modifying cartridge presence

To modify the setting for memory cartridge presence, the user should select the Cartridge box and enable or disable it.

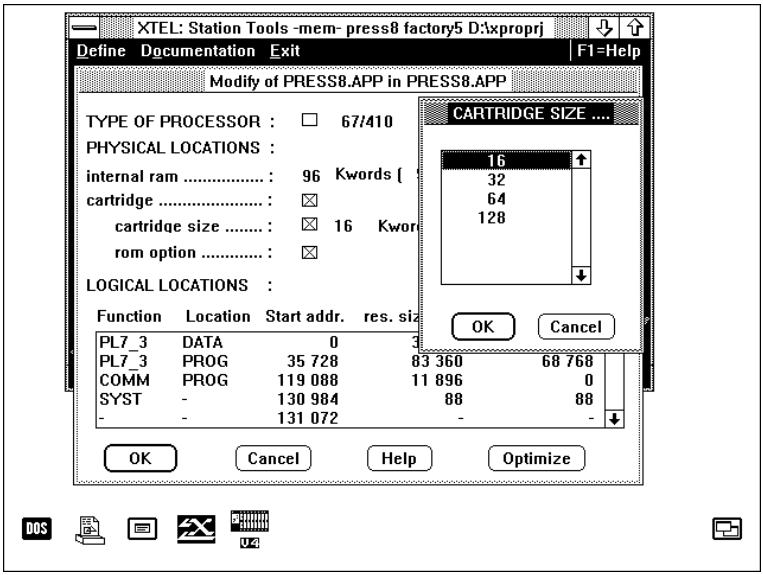


There are two possible cases:

- Adding a memory cartridge: When a memory cartridge is added to the configuration, the program automatically selects the rom option (described later) and the maximum possible cartridge size for the selected PLC processor,
- Deleting a memory cartridge: When a memory cartridge is deleted from the configuration, the rom option, if it was selected, is disabled and the cartridge size setting is reset to zero.

Modifying the size of the cartridge:

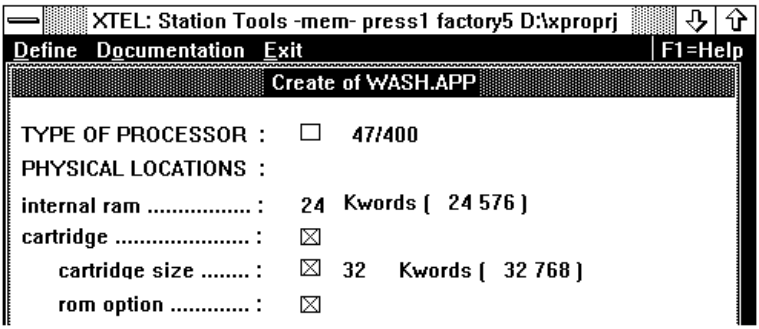
To modify the size of the selected memory cartridge, the user should select the cartridge size box and click on it. A sub-menu lets the user select among the various memory cartridge sizes available for the selected processor type.



If the memory cartridge size is increased or decreased, the user can reorganize the layout and the distribution of the memory fields automatically by selecting the optimize action or manually by changing the start of field address.

Modifying the rom option:

To modify the rom option, the user should select the rom option box and validate the selection.

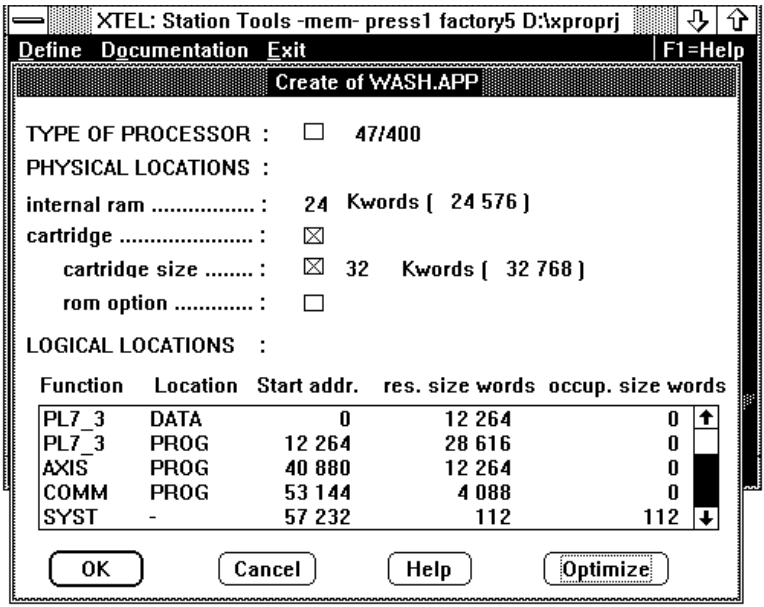


Selecting the rom option lets the user obtain a distribution of memory fields that is adapted to a change of PLC memory cartridge type (RAM/PROM) right from the time the application is created.

With this option selected, the Data fields that cannot be stored in ROM are located in the internal RAM memory and the Prog. fields that can be stored in ROM are located in the cartridge field.

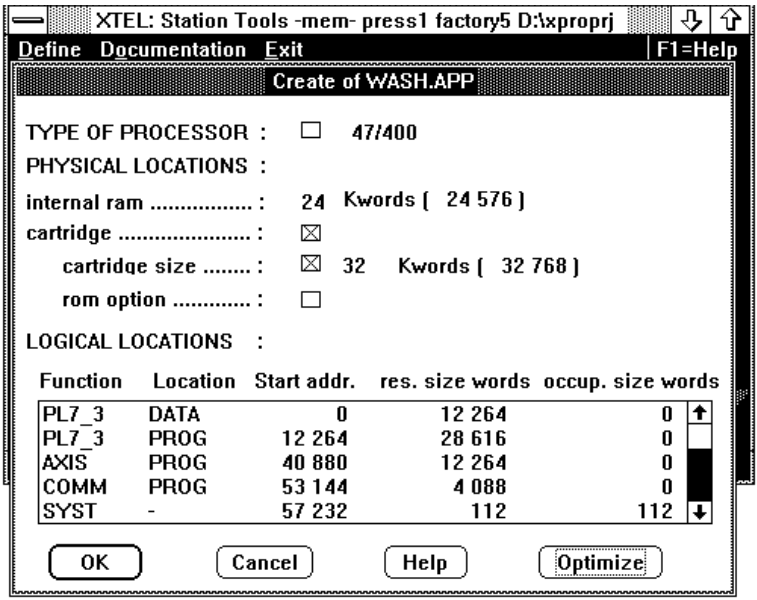
An application with the rom option selected, can be stored in ROM at any time using the PROM Programmer tool. When the rom option is not selected, the application is expanded to fit the entire available memory space. This means that it is possible to find a Prog. field in the internal RAM or Data in the memory cartridge.

Application example with the rom option selected:



In this case the distribution of fields that can or cannot be stored in ROM is determined right from the start. This application can be transferred to a EPROM cartridge at any time.

Application example where the rom option is not selected:



In this case the memory fields are distributed according to memory requirements, with no distinction made between fields that can or cannot be stored in ROM.

There are two ways for the user to obtain an application that can be stored in ROM from an application that cannot be stored in ROM:

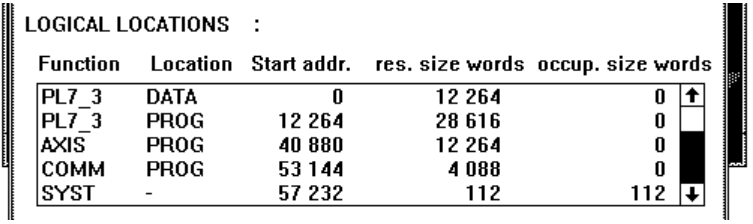
- Automatically by selecting the rom option then clicking on the Optimize button,
- Manually by changing the start of memory field addresses that caused the application not be stored in ROM. (e.g. Data in the memory cartridge or Prog. in internal RAM).

3 - Modifying logical fields

The table that displays the logical fields for each function that the station comprises:

- The type of field: Cannot be stored in ROM = Data, Can be stored in ROM = Prog,
- The field start address in relation to the addressable field,
- The reserved volume,
- The usable volume (information provided by the .BIN file).

The field reserved for the station must always be at the end of the application memory field. Its size is variable and depends on the number of functions and fields defined for the station.



LOGICAL LOCATIONS :

Function	Location	Start addr.	res. size words	occup. size words
PL7_3	DATA	0	12 264	0
PL7_3	PROG	12 264	28 616	0
AXIS	PROG	40 880	12 264	0
COMM	PROG	53 144	4 088	0
SYST	-	57 232	112	112

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The possible modifications are:

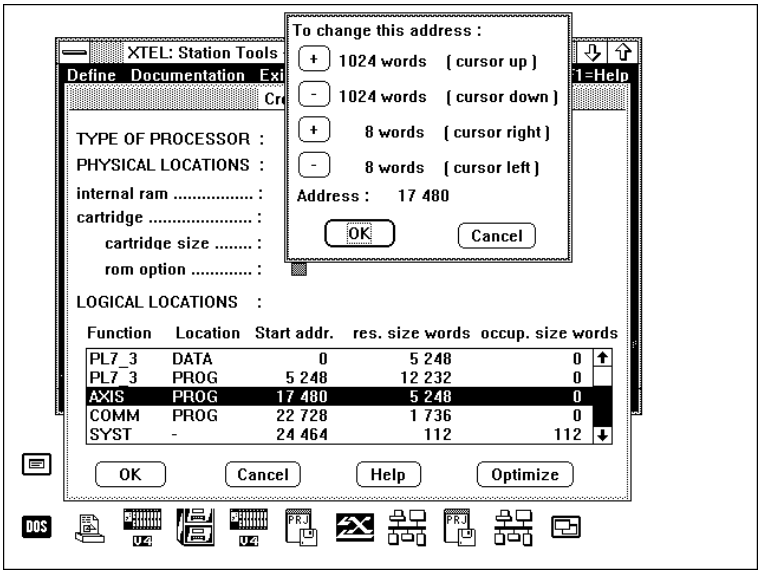
- Moving a field (moving a field that can be stored in ROM from internal RAM to the memory cartridge for example),
- Increasing the size of a reserved volume (by reducing the currently selected start of field address or increasing the start of field address of the next field),
- Reducing the size of a reserved volume (by increasing the currently selected start of field address or reducing the start of field address of the next field).

Notes:

The user can modify the various display fields individually.
If the selected binary files are too large, the minimum configuration will not accept logical fields. A message is displayed and the screen is displayed blank. The user should then select a hardware configuration that is adequate and request optimization in order to display a list of logical fields.

Modify the start address

To modify a start address, the user should select the appropriate field (the currently selected field is shown in reverse video). To select a field, click on it (or press Enter) and a data entry sub-window appears. This window displays the value of the current field and lets the user modify it.



In Modify mode, in the menu that comprises the number to modify and a message telling the user to change the settings displayed. The possible values are displayed in the current field. The cursor keys can also be used to modify the values.

- Cursor Up/Down: fast change in K word (1024 words) increments,
- Cursor Left/Right: slow change in 8 word increments.

Modify a memory field group:

It is also possible to simultaneously change a multiple adjoining fields in the memory. To do this, click on the first field to modify then press Shift while clicking on the last field to modify. The selected fields are displayed in reverse video. The rest of the procedure is the same as that described for the address of a single memory field.

4 - Buttons in the second XTEL-MEM menu

Optimize button

This action positions the logical fields in the available physical memory space according to preset criteria. Optimization only changes the reserved volumes and the start addresses. It guarantees that a correct configuration will be set-up. If the rom option is configured, the sum of the reserved volumes in the fields that can be saved in ROM must not exceed the size of the memory cartridge and the sum of the reserved volumes in the fields that cannot be stored in ROM must not exceed the size of the RAM memory available in the PLC. If this is not the case, an error message will be displayed and optimization will not be performed.

OK Button

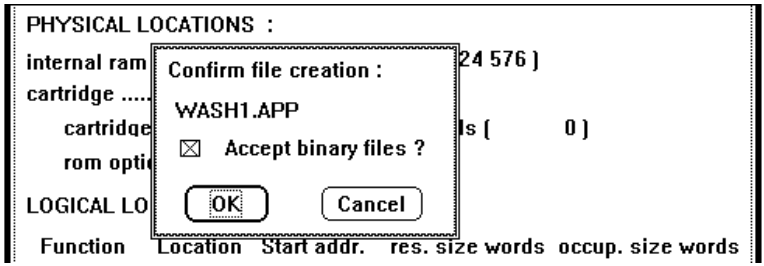
Validates the screen. It is only at this stage that coherence checks are run on the data entered in the menu:

- Coherence check between reserved size and used size in the action fields,
- Coherence check on the physical size and the size of the fields:
  The total size of the logical fields must be less than the Cartridge + Internal RAM size,
- Check on the position of the station descriptor that must be located at the end of the memory field so that it can be located by the PLC program,
- Check, when the rom option is selected, that no data field is located on the memory cartridge and that no Prog. space is located in the internal RAM.

If there is any incoherence between the selections, a message is displayed and the .APP file is not generated. XTEL-MEM runs a diagnostic of the incoherences but does not correct problems caused by overlapping memory fields. The user must select the affected action to correct the problem using the available troubleshooting tools already described.

Result if the checks are correct

If the coherence checks that are run are correct, the following message is displayed:



There are two possible cases:

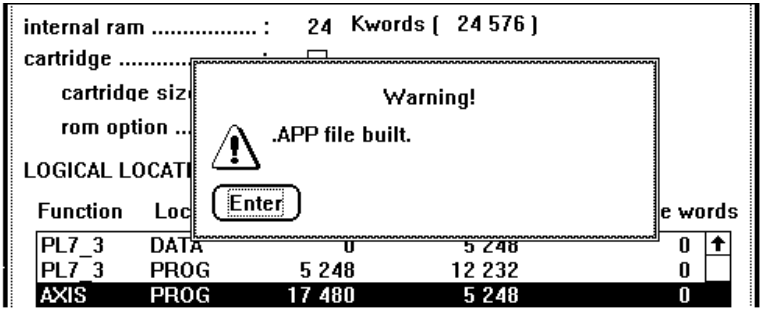
1-When binary files are considered:
XTEL-MEM performs the following operations:

- Check that the list of input binary files is blank:
  - If it is blank, the message “NO BINARY SELECTED. .APP FILE WITHOUT BINARY” is displayed,
  - If it is not blank, the tool will string the binary files into the .APP file in rising order of memory addresses,
- Construction of the station descriptor at the end of the memory field.

2-When binary files are not considered:
The .APP file that is generated does not take into account the station descriptor.

End of .APP file generation

When the .APP file is generated correctly, the following message is displayed:

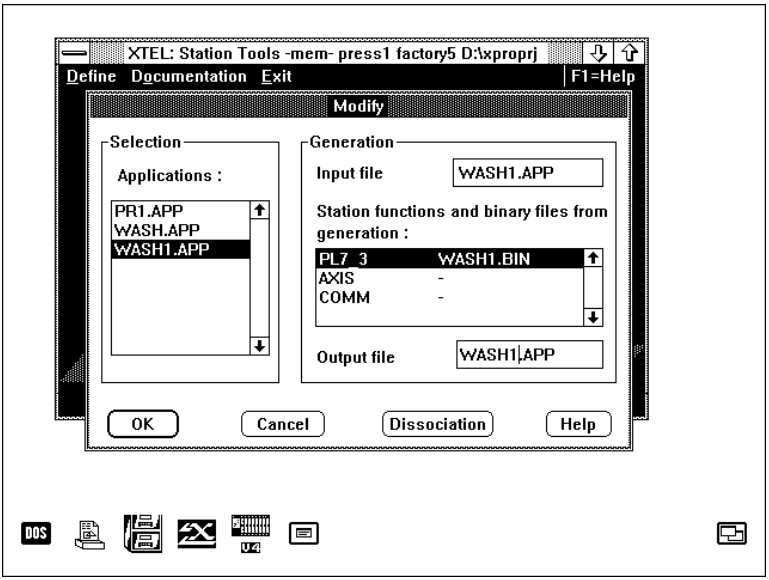


Enter

Returns the user to the XTEL-MEM primary window.

2.4-2 Modify Action

This screen lets the user modify the .APP file. The user should enter the name of the file to modify (input file) and the name of the file where the modifications will be stored (output file).



The screen comprises four entry and display fields and four buttons.

Selection field:
The list of existing applications is used to enter the name of the input .APP file as shown below:

- By double clicking on the file to select, or
- By using the cursor keys to highlight the required file and pressing Enter to select it.

The name of the selected input file is taken by default as the name of the output file.

Generation field (station functions and binary files from generation):
This field lists all of the functions that are declared in the station. When the .APP file name has been declared, the binary files that were selected when it was created are displayed opposite the functions that they are assigned to. A binary file can be added or replaced. For more information on binary file selection and deselection, refer to the previous section.

Entry fields (input and output files):

These fields comprise the field where the name of the .APP file to modify is entered (input file) and the field where the name .APP file to generate is entered (output file).

OK
Calls-up the second Create action screen. Refer to the previous section for a detailed description of how to use this screen,

Cancel
Cancels the display and returns the user to the XTEL-MEM primary window,

Dissociation
Deletes the link between the action and the binary file selected in the Generation field,

Help
Lets the user access the XTEL-MEM help screens.

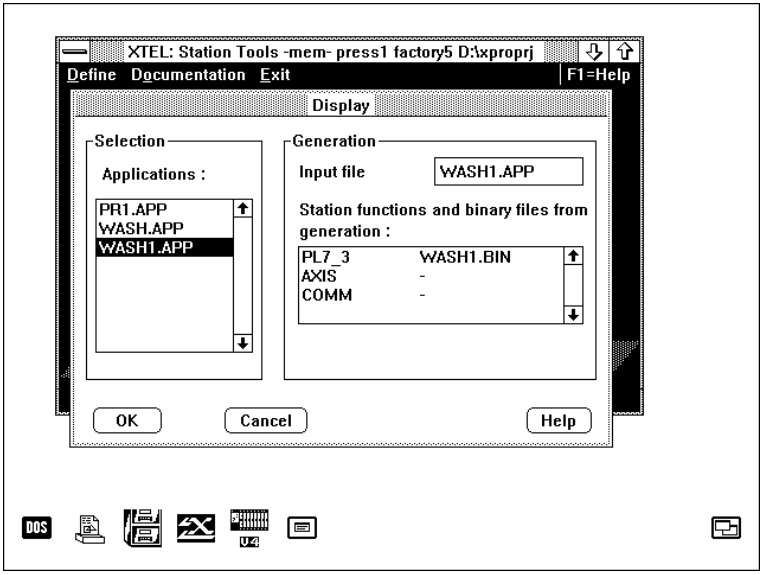
Notes:

When the selected type of PLC processor is changed, this modification may be accepted by the XTEL-MEM but refused by the PL7-3 action (e.g. the number of the network interface module may be incompatible with selected PLC). The user must take steps to correct this conflict in the PL7-3 application.

When the selected type of PLC processor is changed, this modification may change the size of the internal RAM memory. The only rule that must be observed when this configuration is validated, is to ensure that the station descriptor (in the SYST field) is located at the end of the memory field.

2.4-3 Display Action

This screen lets the user display the .APP file. The user should enter the name of the file to display in the Input File field.



The screen comprises three entry and display fields and three buttons.

Selection field (Applications):
The list of existing applications is used to enter the name of the input .APP file as shown below:

- By double clicking on the file to select, or
- By using the cursor keys to highlight the required file and pressing Enter to select it.

Generation field (Station functions and binary files from generation):
This field lists all of the functions that are declared in the station. When the .APP file name has been declared, the binary files that were selected when it was created are displayed opposite the functions that they are assigned to. No modification is possible in this field.

Entry field (Input file):
This field lets the user enter the name of the .APP file to display.

OK
Calls-up the second Create action screen,

Cancel
Cancels the display and returns the user to the XTEL-MEM primary window,

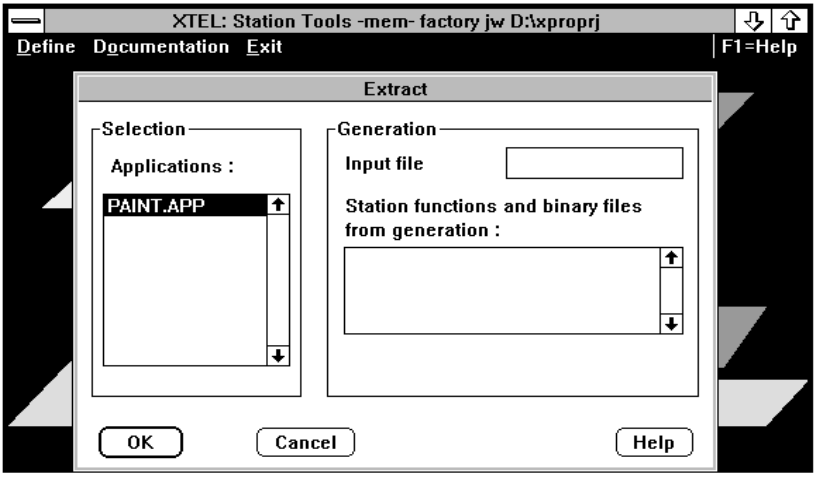
Help
Lets the user access the XTEL-MEM help screens.

2.4-4 Extract Action

This action lets the user extract the corresponding function binary files (xxxx.BIN files) from an application (xxxx.APP file).

Calling-up the Extract sub-menu lets the user:

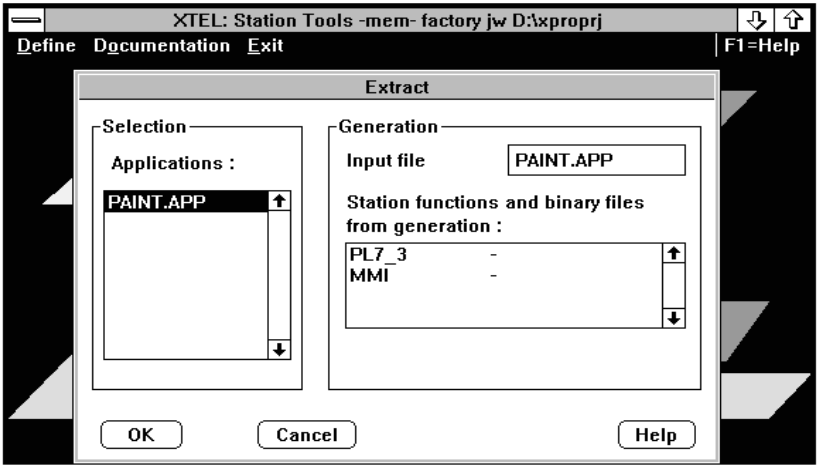
- Select the xxxx.APP file to extract function binary files from,
- Establish which binary files are actually in the xxxx.APP file compared with the functions mapped in the application.



The screen comprises three display and data entry fields and three buttons.

Selection field (Applications):
The list of existing applications is used to enter the name of the xxxx.APP file selected as the source to extract a binary file xxxx.BIN from. The extract procedure is:

- Double click on the file to select it, or
- Use the cursor keys to highlight the file to select and press <ENTER> to confirm the selection.



Generation field (Station functions and binary files from generation):
This field lists all of the functions declared in the station. The name of an xxxx.BIN file is displayed opposite the functions for which a binary file is actually present. This tells the user at a glance which functions have an xxxx.BIN file that can be recovered from the xxxx.APP file.
The user can select the function for binary file extraction by:

- Clicking on the function, or
- Using the cursor keys to highlight the function to select and pressing <Enter> to confirm the selection.

Note:

Selecting a function that does not have any xxxx.BIN binary files assigned to it will cause an error message to be displayed.

OK
Displays the xxxx.BIN files that exist for the selected function (refer to the screen on the next page),

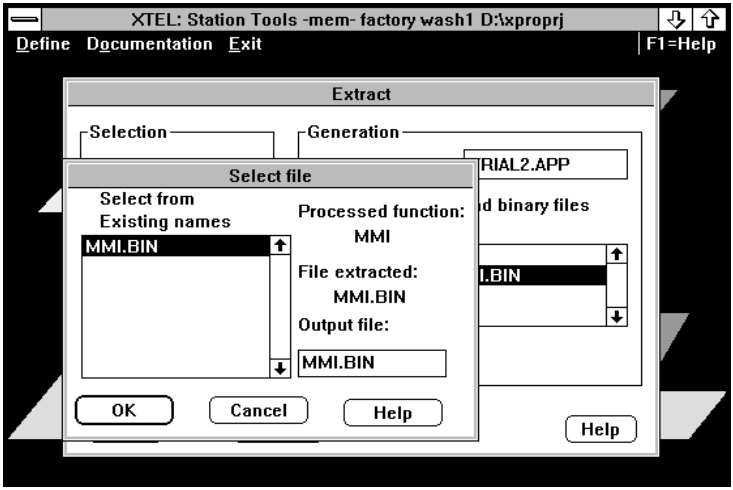
Cancel
Cancels the extract action and returns the user to the primary window,

Help
Lets the user access XTEL-MEM help screens.

Display field (Input file):
This field displays the name of the xxxx.APP file from which an xxxx.BIN file is extracted.

Selecting an xxxx.BIN file assigned to a function

Validating the previously selected function will display a window with a list of all of the xxxx.BIN files already created for the function. This also lets the user enter the name under which the binary file extracted from the xxx.APP file will be saved.



D

The user can select the binary file to extract by:

- A single click on the name of the file to extract,
- Using the cursor keys to highlight the selected file name,
- Direct entry of the file name in the output file field.

This window displays:

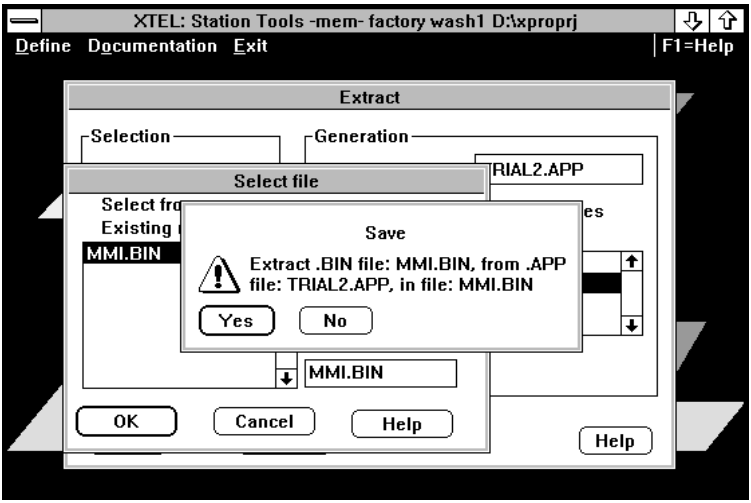
- The selected function (e.g. MMI),
- The name of the extracted file (e.g. MMI .BIN),
- The name of the output file in which the extracted file is stored.
  The name of this file can be selected from the list of existing files or a new name can be entered by the user.

OK
Displays a dialog box that displays information on the current actions (refer to the screen shown on the next page),

Cancel
Returns the user to the previous screen,

Help
Lets the user access XTEL-MEM help screens.

Extracting a file



YES
Starts the extract action,

NO
Returns the user to the previous screen.

D

2.4-5 Integrate Action

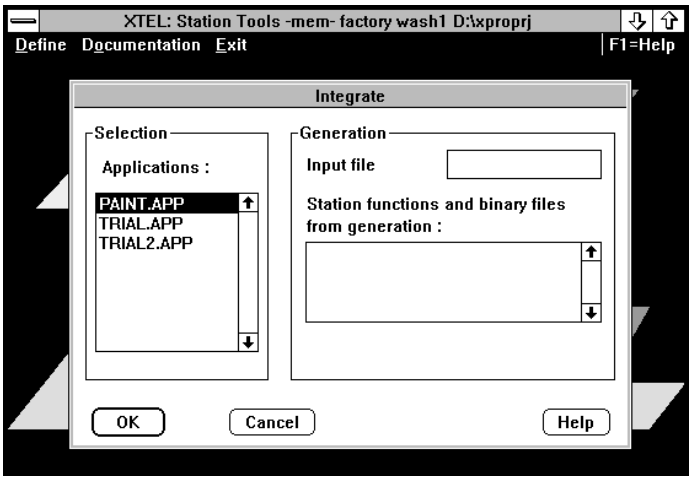
The reverse action to extract, the integrate action lets the user integrate a binary function file (xxxx.BIN) into an application file (xxxx.APP).

Important note

> This operation is performed without changing the memory mapping. This implies that the binary file to integrate is compatible with the elements declared in the xxxx.APP file when it was created.

Selecting the integrate sub-menu lets the user:

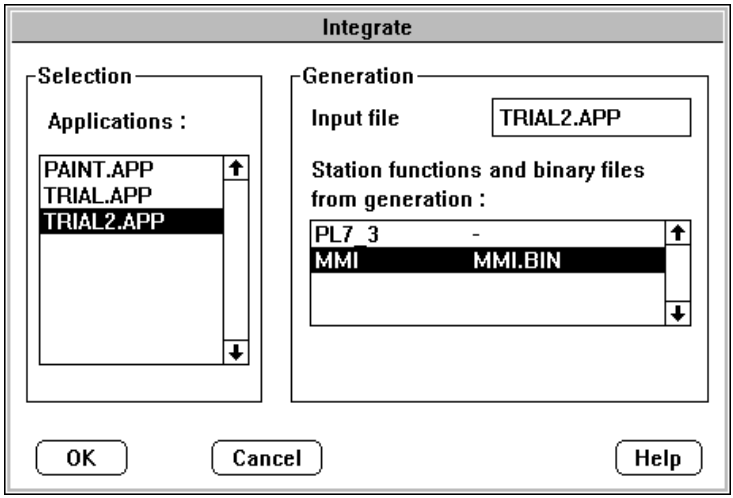
- Select the xxxx.APP into which a new xxxx.BIN binary file should be integrated,
- Determine which binary files are already present in the xxxx.APP file for each function mapped,
- Select a function to update.



The screen has three display and data entry fields and three buttons.

Selection field (Applications):
The list of existing applications is used to enter the name of the xxxx.APP file that the binary file is to be integrated into. The user can make the selection by:

- Double clicking on the file to select, or
- Using the cursor keys to highlight the file to select and pressing <Enter> to confirm the selection.



Generation field (Station functions and generated binary files)
This field lists all of the functions declared in the station. The name of an xxxx.BIN file is displayed opposite the functions for which a binary file is actually present. This field lets the user select the function for which a new xxxx.BIN file is to be integrated.
The user can select the function for binary file integration by simply clicking on it.

OK
Displays the xxxx.BIN files that exist for the function in the selected station (refer to the screen on the next page),

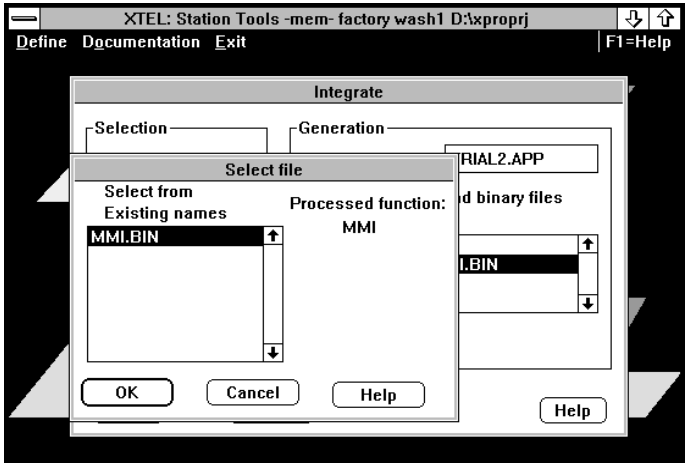
Cancel
Cancels the integrate action and returns the user to the primary window,

Help
Lets the user access XTEL-MEM help screens.

Display field (Input file):
This field lets the user enter the name of the xxxx.APP file into which the xxxx.BIN file is to be integrated.

Selecting an xxxx.BIN file to integrate

Validating the previously selected function will display a window that displays a list of all of the xxxx.BIN files already created for the selected function in the station.



D

The user can select the binary file to integrate by:

- A single click on the name of the file to integrate, or
- Using the cursor keys to highlight the file to select and pressing <ENTER> to confirm the selection.

This window displays:

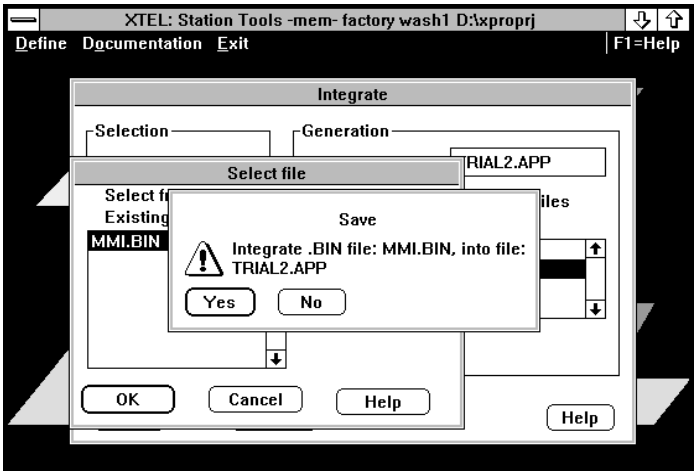
- The selected function (e.g. MMI),
- The name of the xxxx.BIN binary files available for the function (e.g. MMI.BIN).

OK
Displays a dialog box that displays information on the current actions (refer to the screen shown on the next page),

Cancel
Returns the user to the previous screen,

Help
Lets the user access XTEL-MEM help screens.

File integration



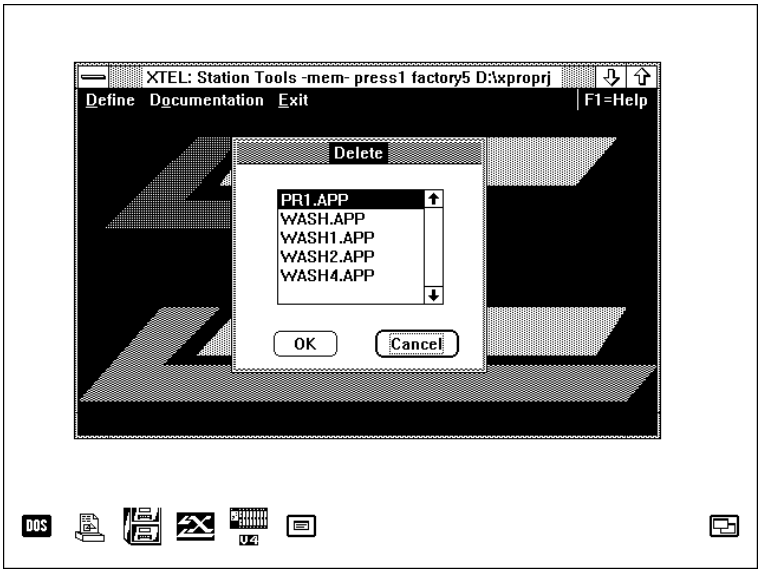
YES
Starts the integrate action,

NO
Returns the user to the previous screen.

D

2.4-6 Delete Action

This screen lets the user delete the .APP file. The list of existing .APP files is displayed on-screen. The file to be deleted is displayed in reverse video when the user selects it by clicking on its display line.



OK
Deletes the selected .APP file,

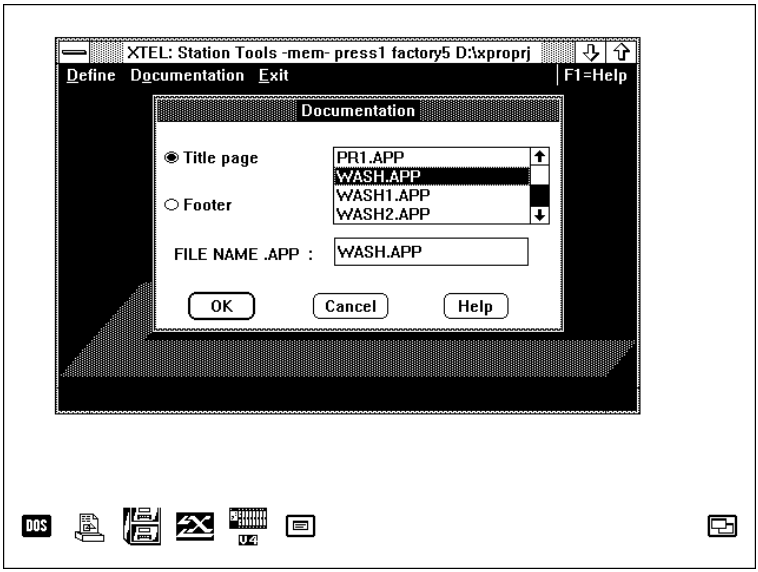
Cancel
Cancels the delete action and returns the user to the XTEL-MEM primary window.

2.5 DOCUMENTATION Menu

2.5-1 Documentation Action

The user can select to enter the Title Page or the Footer for the .APP file to document. The files that are generated take the same name as the selected .APP file, only their extensions are different:

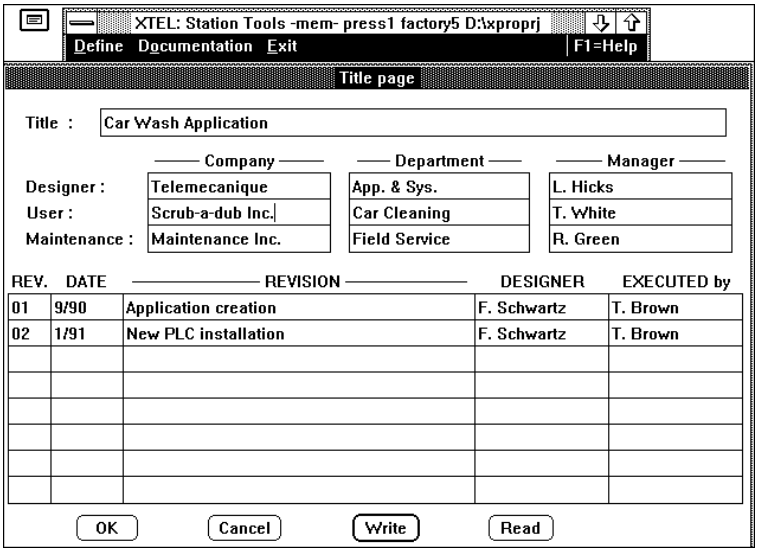
- xxx.TIT for the Title Page,
- xxx.CRT for the Footer.



Title Page Entry

When this menu is first selected, the entry fields contain the contents of the xxx.TIT file if it already exists. Otherwise they are blank.

The user can access a preset field with the mouse or the Tab key. Within the same field, the columns and lines are accessed with the mouse or cursor keys.



The various possible entries are:

- TITLE :Application title (64 chars. max.),
- COMPANY :Company Name (16 chars. max.),
- DEPARTMENT :Department Name within the Company (16 chars. max.),
- MANAGER :Manager's Name (16 chars. max.),
- REV. :Project revision level (3 chars. max.),
- DATE :Project creation or modification date (8 chars. max.),
- REVISION :Project revision description (32 chars. max.),
- DESIGNER :Designer's Name (12 chars. max.),
- EXECUTED BY :Programmer's Name (12 chars. max.).

The .TIT file is generated in ASCII format and can be edited by the user.

OK
Saves the screen to the xxx.TIT file and lets the user exit the screen,

Cancel
Cancels the display and lets the user exit without saving the xxx.TIT file,

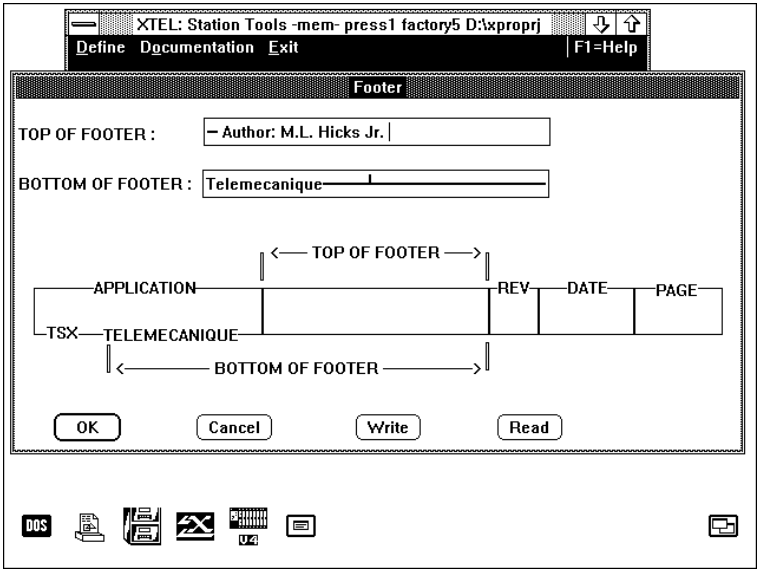
Write
Writes the contents of the screen to the YYY.TIT file without exiting the screen,

Read
Reads the contents of the YYY.TIT file saved during a previous session.

Entering a custom footer

This screen lets the user customize the footer that appears at the bottom of the documentation file. Two character strings can be customized by the user:

- A string of 25 characters that appears at the top of the footer,
- A string of 45 characters that appears at the bottom of the footer.



The various fields take the contents of the xxx.CRT file if it already exists (the name xxx is the same as that of the selected .APP file).

The footer provides the following information:

- Application name,
- Name of the section printed,
- Document version number,
- Date of the print-out,
- Page numbering within each section,
- Absolute page numbering.

OK
Saves the screen to the xxx.CRT file and lets the user exit the screen,

Cancel
Cancels the display and lets the user exit without saving the xxx.CRT file,

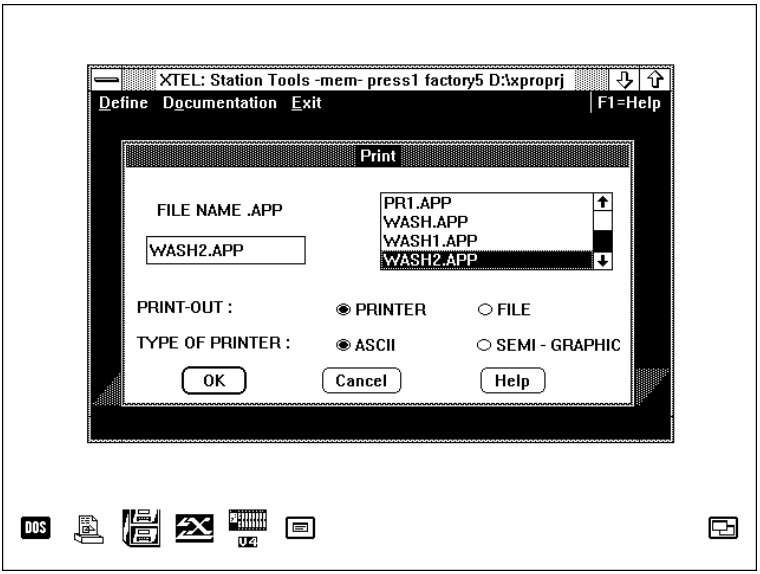
Write
Writes the contents of the screen to the YYY.CRT file without exiting the screen,

Read
Reads the contents of the YYY.CRT file saved during a previous session.

2.5-2 Print Action

This action lets the user print all or part of the application documentation file:

- To a printer from a .DOC file or to disk as a .DOC file,
- Using an ASCII or IBM standard semi-graphic printer.



OK

Prints the application documentation file,

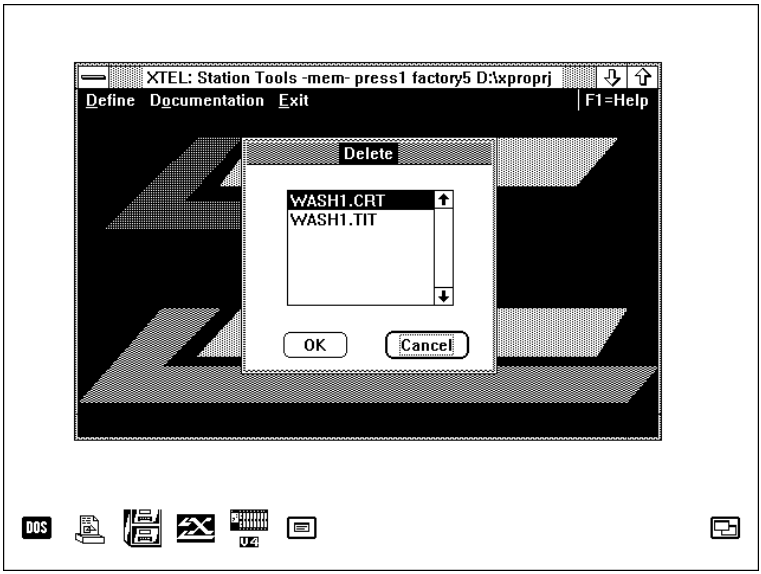
Cancel

Cancels the print action and returns the user to the XTEL-MEM primary window,

2.5-3 Delete Action

This action lets the user delete files generated by the Documentation action. It is only available with the following types of file:

- XXX.TIT,
- XXX.CRT,
- XXX.DOC.



OK
Deletes the selected file,

Cancel
Cancels the delete action and returns the user to the XTEL-MEM primary window.

2.6 Error Messages

DATA field in cartridge. Application cannot be stored in rom as is

Probable cause	Corrective action
When the action is validated and the rom option is selected, this message warns that a Data field is located in the cartridge or is too large.	Move the Data field by changing its start of field address or by optimizing it.

Incorrect file name

Probable cause	Corrective action
Incorrect file name entered (more than 8 chars. or incorrect extension).	Enter a correct file name.

D

Incorrect output file name

Probable cause	Corrective action
Incorrect file name syntax (more than 8 chars. or incorrect extension).	Enter a correct file name.

No function is defined in the current station, there is no field to display

Probable cause	Corrective action
This message warns the user that no functions have been defined in the X-TEL environment.	Define the functions for the current station.

No INPUT FILE name

Probable cause	Corrective action
No input file name entered.	Enter an input file name.

No selected binary file and/or BIN pl7_3 not built in. .APP file built without binary code

Probable cause	Corrective action
Warns the user that no binary file was selected when creating or modifying an .APP file.	The user does not have to select a binary file when creating or modifying an .APP file.

Not enough cartridge space. Invalid configuration

Probable cause	Corrective action
During optimization with the rom option selected, the space taken by PROG fields is greater than the space available in the cartridge.	Insert a higher capacity cartridge. If the cartridge is already the highest capacity compatible with the PLC, select a different PLC.

Not enough physical space. Change the processor type or the cartridge

Probable cause	Corrective action
The size of the reserved fields exceeds the amount of physical space available.	If the amount of physical space cannot be increased by changing the memory cartridge, change the PLC.

Not enough ram space. Invalid configuration

Probable cause	Corrective action
The space taken by the Data type fields is larger than the internal RAM of the PLC.	Select a hardware configuration comprising a PLC with more RAM memory capacity.

Memory exhausted. On validation, APP built without BIN PL73 reusing the available space of PROG PL73

Probable cause	Corrective action
The binary data file assigned to the PL7-3 function is too large.	Reduce the size of the binary file assigned to the PL7-3 function or select a PLC configuration with more hardware capacity.

D

PROG field in ram. Application cannot be stored in rom as is

Probable cause	Corrective action
When the action is validated and the rom option is selected, this message warns that a Data field is located in the cartridge or is too large.	Move the Data field by changing its start of field address or by optimizing it.

Specified file does not exist or cannot be accessed

Probable cause	Corrective action
The file to delete cannot be found.	The file was already deleted or is not present in the current station.

The input file is not in .APP file format

Probable cause	Corrective action
The input file is an .APP file but its data cannot be used (damaged file or another type of file saved with an .APP extension).	Select or create another .APP file.

The output file already exists, it will be overwritten

Probable cause	Corrective action
The file where data is to be stored already exists.	The cancel button lets the user cancel the action without making any changes to the existing file.

The station descriptor must be located at the end of the memory space

Probable cause	Corrective action
The station descriptor (SYST field) is not located at the end of the physical space.	Move the station descriptor by changing its start address or by optimizing.

You have at least one logical space where the space occupied exceeds the reserved space

Probable cause	Corrective action
One of the logical fields is larger than its reserved space.	Increase the size of the appropriate fields by changing its start address or by optimizing it.

xxx is a binary code from file .APP no longer defined at this station

Probable cause	Corrective action
The .APP file contains the binary code indicated but it does not exist or is no longer present in the current station.	If modification continues, the contents of the .APP file will be lost.

xxx is a function from file .APP no longer defined at this station

Probable cause	Corrective action
The .APP file contains the function indicated but it is not selected in the current station.	If modification continues, the .APP file will be defined in the indicated function.

3.1 Presentation

3.1-1 General

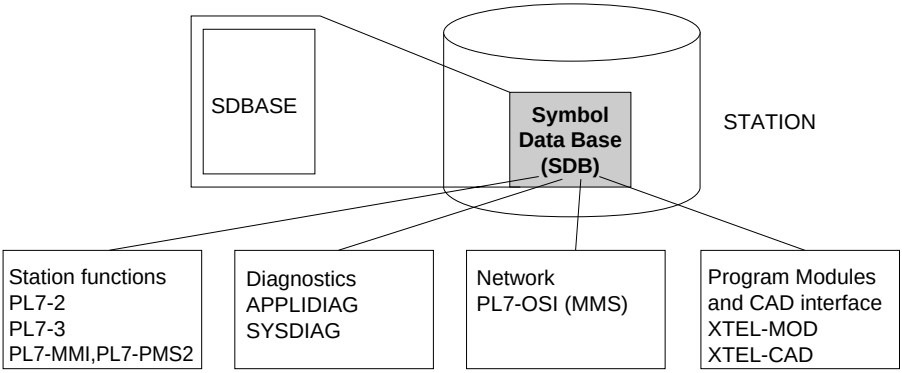
XTEL-SDBASE lets the user manage and create the Symbol Data Base (SDB) for the station and makes available a common data base that can be accessed by all programs installed in the station, which in turn makes a available a common base of information comprising each variable, its symbol, a comment and an (optional) extended comment. In the X-TEL Software Workshop, a PLC station can only have a single Symbol Data Base common to all tools and dedicated functions in the station.
The data base can be:

- Entirely entered by the user, or
- Initialized from data created in XTEL-MOD or XTEL-CAD.

XTEL-SDBASE is accessed at station level. It replaces XTEL-SYMB for all applications developed with TXT L BASE V4 software and integrated into the TXT L BASE V6 Software Workshop.

The symbol data bases can be accessed by the following programs:

- Dedicated function programs : PL7-2, PL7-3, PL7-3, PL7-MMI/PMS2
- Diagnostics program : APPLIDIAG, SYSDIAG
- Network program : PL7-OSI (MMS)
- User module management program : XTEL-MOD
- CAD file interface program : XTEL-CAD



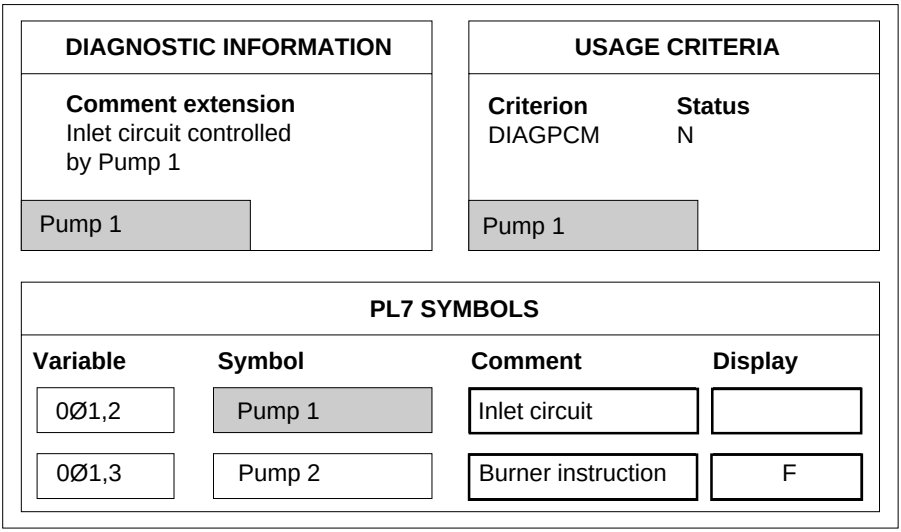
XTEL-SDBASE provides the following functions:

- Creating and updating a symbol data base that is unique to each station,
- Viewing a symbol data base,
- Generating and printing symbol data base documentation,
- Symbol data base management: save, restore, compact...
- Data base sorting by alphabetical order of symbols, variables or comments,
- Compatibility with the installed base:
  - Import a symbol data base created in XTEL-SYMB,
  - Import/export symbol text files,
  - Copy/Paste a symbol data base between two stations.

3.1-2 Symbol Data Base Display

XTEL-SDBASE allows access to the Station Data Base (SDB), symbol data base for each station and provides a symbol editor.

- **The SDB accessed from XTEL-SDBASE**
  This view shows all of the variables represented by a symbol and assigned to the various functions and diagnostic tools present in the station. This view comprises three screens that are logically linked by the symbol field.



3.1-3 Defining Data Base Objects

An object comprises several fields that are managed
- either by the user,
- or by the system.

Fields managed by the user:

- **Variable field:** required
  Displays or allows the user to enter a TSX Series 7 language object.
  Example: W10 Internal word I41,16 Input
  B10 Internal bit O01,2 Output
- **Symbol field:** required
  This field displays or allows the user to enter a symbol that will be assigned to a TSX Series 7 language object. The character string entered as the symbol must obey predefined syntax rules.

A Symbol comprises not more than eight alphanumeric characters, starting with a letter or the character # if the symbol is generated automatically.
The first letter must be in **upper case**, the others can be lower case or figures or the characters "_", "$", "%", "|" and "~". PL7 objects and instructions (W0, B10, IF, THEN, etc.), OFB elements and extended ASCII codes are not accepted. A symbol can start with a PL7 object or instruction name (W0_mast, B10prl, etc.).

- **Comments field:** optional
  This field displays or allows the user to enter a comment for a symbol. There are no restrictions as long as the total length does not exceed 32 characters.
- **Comment Extension field:** optional
  This field displays or allows the user to enter a comment extension for the comment. The length of the comment extension is open. It is split into 32 character strings. The comment extension is intended to assist in providing diagnostic information.
- **Display field:** optional
  For V5 level stations, this field indicates to the user and to the various tools and functions how the variable is coded : Binary, Decimal, Message, Floating point, Hexadecimal.
- **Criteria field:**
  This field displays the functions or tools that use or have used the symbol. The criteria are proposed by XTEL-SDBASE according to the programs installed in the station and automatically selected by the program that calls-up the symbol editor. The user can change criteria selection. The PL7-3 criteria is implicit for all symbols in the data base, it is therefore not shown in the list.

  Note: certain criteria can only be managed by functions or tools and cannot be chosen by the user during their criteria selection.

  Example of criteria used for a TSX/PMX V5 station:
  DIAG PCM Man-machine interface diagnostic tools (DIAG).

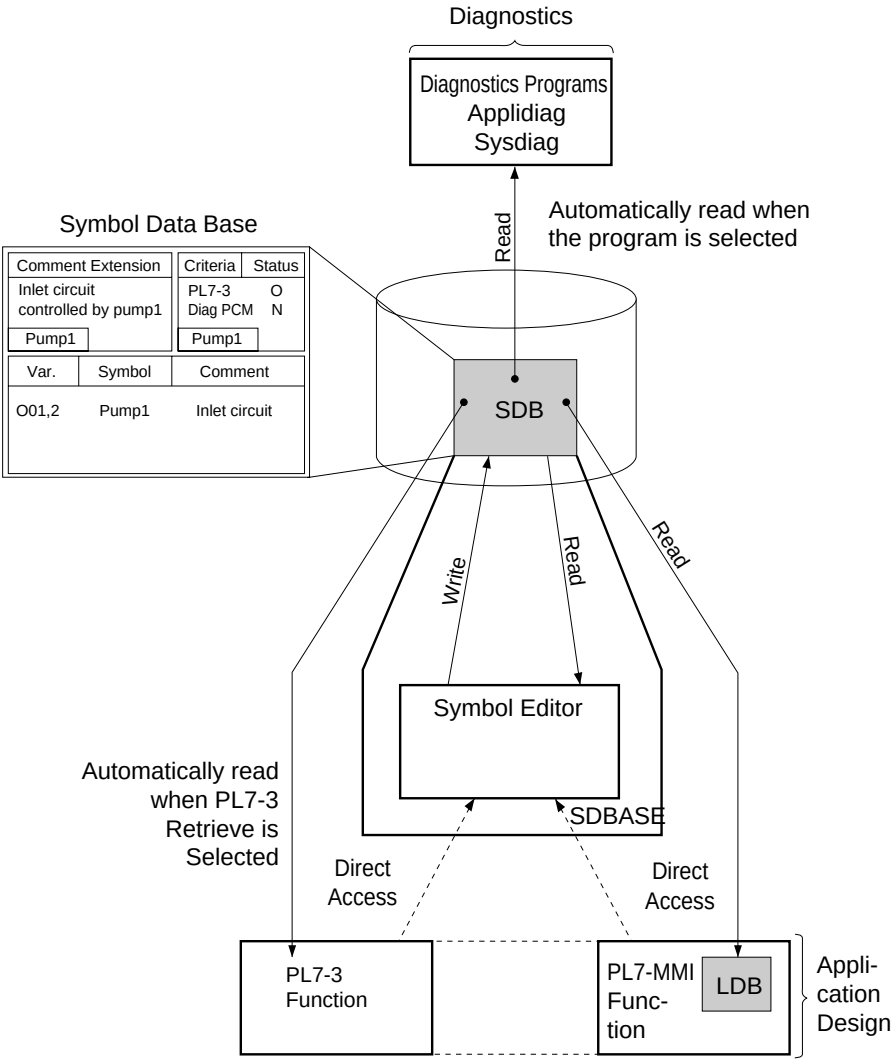
  Example of criteria used for a TSX 17/27 and TSX 47 station:
  PL7-2 PL7-2 station function.

Field managed by the system:

- **Status field**
  This field can only display an identifier that informs the user on the update status of a symbol. This is useful as a symbol may take:
  - **Status N** (New): Created in the Station Data Base but not integrated into the Local Data Base of a function, or not read by the function or tool.
  - **Status O** (Old): Created in the Station Data Base and integrated into the Local Data Base of a function, or read by a function or tool.
  - **Status D** (Deleted): Deleted from the Station Data Base but not yet deleted from the Local Data Base of a function.
  - **Status P** (Pedalbin): Deleted from the Station Data Base and from the Local Data Base of a function. It will be completely deleted from the base records once the data base has been compacted.

  It is possible for the user to delete the criteria assigned to a symbol (Status D).

3.1-4 Diagram



SDB Symbol Data Base
LDB Local Data Base for a function

SYMBOL DATA BASE (SDB)
Created and managed only by XTEL-SDBASE, it combines all of the symbols and elements assigned to a station.
It can be accessed directly by the tools or functions.

TOOL OR FUNCTION LOCAL DATA BASE (LDB)
The tools or functions access the station Symbol Data Base (SDB) to copy one or more symbols to their own field that is called the Local Data Base (LDB).

Creation, modification, or deletion of a symbol is always performed by XTEL-SDBASE.

3.2 Functions

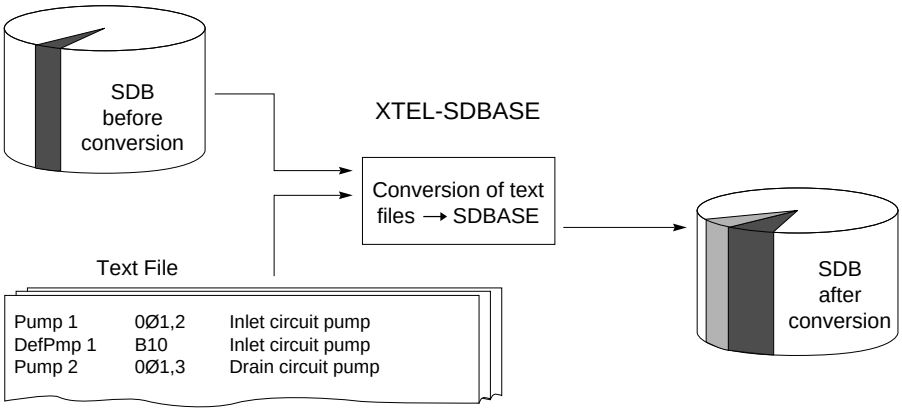
The Symbol Data Base (SDB) of a station can be created by:

- A merge action :
  - Conversion of text files sent from dedicated PL7 functions. Two types of text file can be converted:
  file in standard format (.SCY): this contains variables, symbols and comments.
  file in extended format (.SCZ): this contains variables, symbols and comments and comment extensions (display base if V5 base).
  - A Symbol Data Base generated by XTEL-SYMB,
  - Symbol files from a CAD program and processed by XTEL-CAD.
- Using program modules generated by XTEL-MOD,
- Pasting a SDB from another station,
- Interactive entry of variables, symbols and comments.
- Pasting the XTEL-SDBASE tools from another station.

D

3.2-1 Creating an SDB by Converting Text Files

This type of creation is performed by reading the existing symbols generated by PL7-3 and PL7-2 applications and reorganizing the data read from them.



When the merge action is performed, all of the symbols are inserted into the SDB. A new SDB created in this way is a superset of the previous one.
XTEL-SDBASE offers :

- 3 merge modes, if a symbol or variable is present both in the text file and in the existing SDB :
  - Overwrite mode gives priority to the one in the text file,
  - No Overwrite mode gives priority to the one in the SDB,
  - Dialog mode lets the user choose between the one in the SDB and the one in the text file,

- 2 file formats: standard format and extended format,
- criteria selection.

If any errors occur during the merge operation, they are stored in an error file that can be displayed once the operation is complete. This allows the user to make necessary corrections in the source text file.

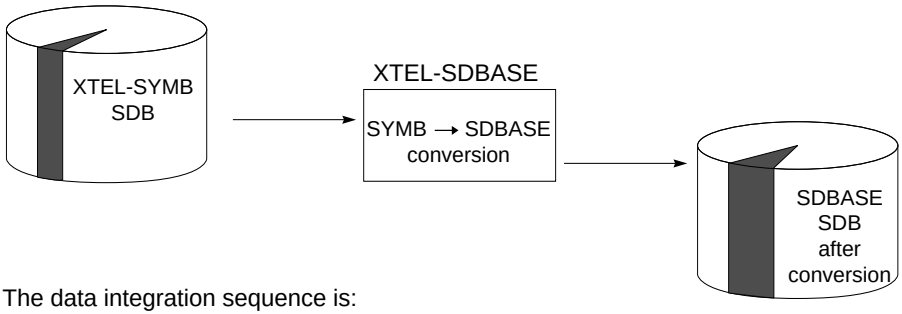
Note: If an SDB must be completely initialized from a text file, it is possible to do this by deleting the existing SDB, then converting the text file.

3.2-2 Creating an SDB by Converting an SDB Created with XTEL-SYMB

This action applies to users that have existing applications developed with TXT L BASE V4 and XTEL-SYMB software, that are migrating to TXT L BASE V52 level software.

This feature converts data from the XTEL-SYMB format symbol data base into XTEL-SDBASE Station Data Base format.

This merge action can only be performed if the merge target station is a V4 level one (1). To perform this, XTEL-SDBASE recovers the XTEL-SYMB format data and automatically integrates it into the SDB.



The data integration sequence is:

- The PL7 SYMBOLS display is updated with the symbols, variables and comments read from the PL7 View in XTEL-SYMB,
- The DIAGNOSTIC INFORMATION display is updated by the comment extensions read from the Diagnostics View and converted to 32 character strings,
- The USAGE CRITERIA display is automatically updated. All symbols read from XTEL-SYMB are assigned a criteria defined when merge is performed:
  - All symbols read from XTEL-SYMB are assigned a criteria defined when the merge action is performed.

  Note: Once the migration to XTEL-SDBASE is complete (SYMB -> SDBASE action), XTEL-SYMB can no longer be used on the data and can be deleted.

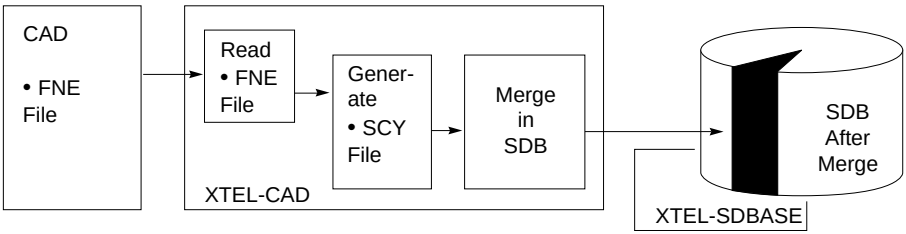
(1) If a V5 type station is used, proceed in two steps:
- First, migrate from the XTEL-SYMB format symbol data base to a V4 level station,
- Cut/Paste from the V4 Station Data Base to the V5 Station Data Base.

3.2-3 Creating an SDB from Symbol Files Generated by a CAD Program

This operation converts data from CAD programs used to produce electrical diagrams into XTEL-SDBASE format to create an SDB. The optional XTEL-CAD program is required.

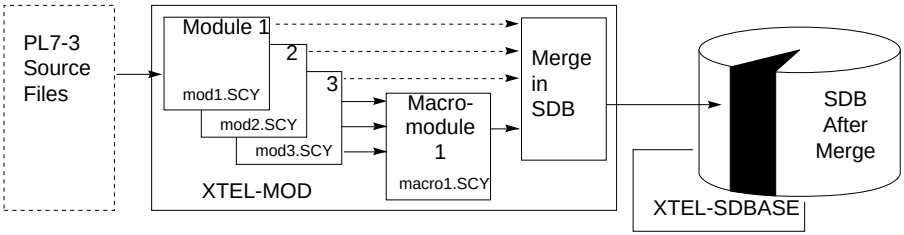
To perform this, XTEL-CAD reads the data in the .FNE type file (an ASCII interchange file generated by compatible CAD programs) and converts it into a .SCY file that can be used with PL7-2 and PL7-3 programs. Once the .SCY file is generated, XTEL-CAD automatically updates the SDB. XTEL-SDBASE supports three merge modes, if a symbol or variable is present both in the .SCY file and in the existing SDB:

- Overwrite mode gives priority to the one in the .SCY file,
- No Overwrite mode gives priority to the one in the SDB,
- Dialog mode lets the user choose between the one in the SDB and the one in the .SCY file,



3.2-4 Creating an SDB from Program Modules or Macro-Modules Generated by XTEL-MOD

XTEL-MOD uses the PL7-3 source files to generate the .SCY files corresponding to each program module or macro-module created. These can be merged directly from XTEL-MOD into the SDB.

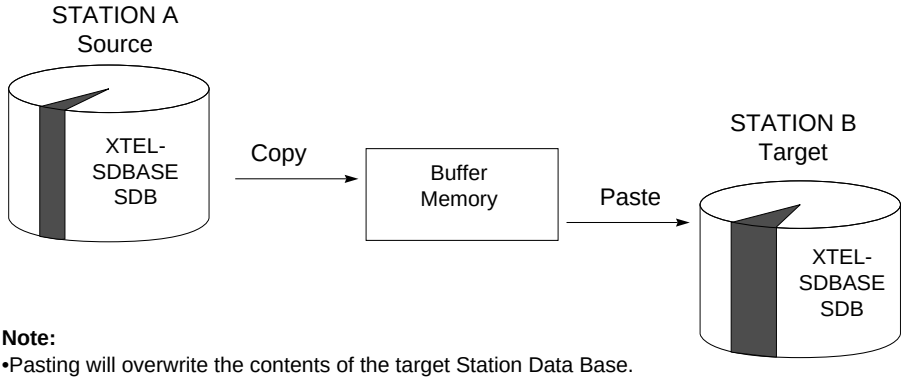


3.2-5 Creating an SDB by Copy/Paste from another Station

The SDB is created by copying the Symbol Data Base (in XTEL-SDBASE format) from an existing station.

This action is performed in two steps:

- From the source station: copy the symbol data base,
- From the target station: paste the symbol data base.



Note:

•Pasting will overwrite the contents of the target Station Data Base.

•If the source data base is in XTEL-SYMB format, first migrate it to XTEL-SDBASE format.

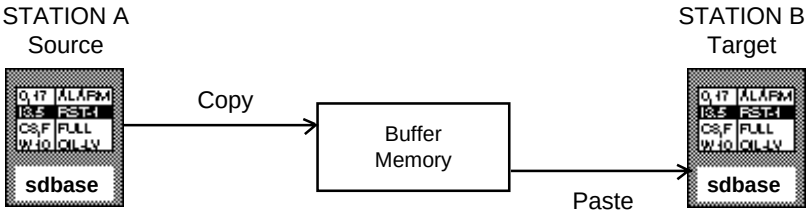
D

3.2-6 Creating an SDB by Copy/Paste of XTEL-SDBASE

This type of creation is performed by copying XTEL-SDBASE from an existing station.

This action is performed in two steps:

- From the source station: copy XTEL-SDBASE,
- From the target station: paste XTEL-SDBASE.



These actions are performed without running XTEL-SDBASE, simply by using the Copy/Paste actions in the Define menu accessed in the Station Tools window.

3.2-7 Creating, Deleting and Modifying a Symbol

- **Creating a symbol**

  - Using XTEL-SDBASE

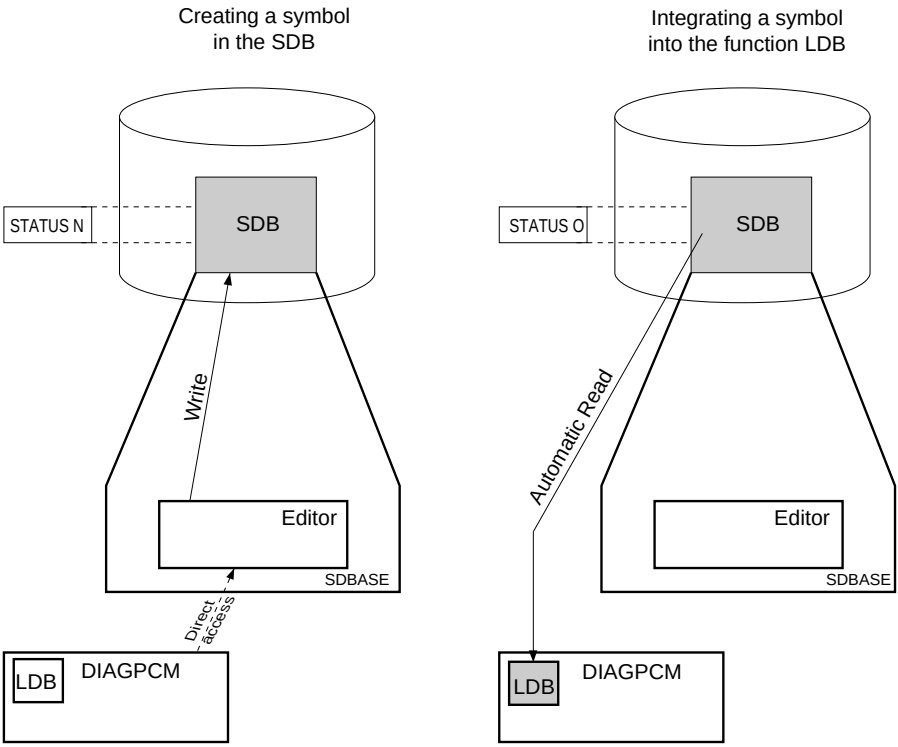
  Before entering a symbol, the user must first, if necessary, select the usage criteria defining the functions and user tools : PL7-2, DIAG PCM, etc (PL7-3 is used automatically and does not require any criteria to be selected).

  Each variable or marker entered is assigned a symbol (essential) and a comment (optional). After the symbol is inserted into the SDB, if a criterion is defined, it will automatically be assigned **status N**. When the function affected by a criterion has read the symbol or has integrated it into its SDB, the status associated with this criterion will be at 0.

  - Using a function

  The criteria will automatically be assigned and reflect the function that called-up the editor. The rest of the procedure is the same as that described above.

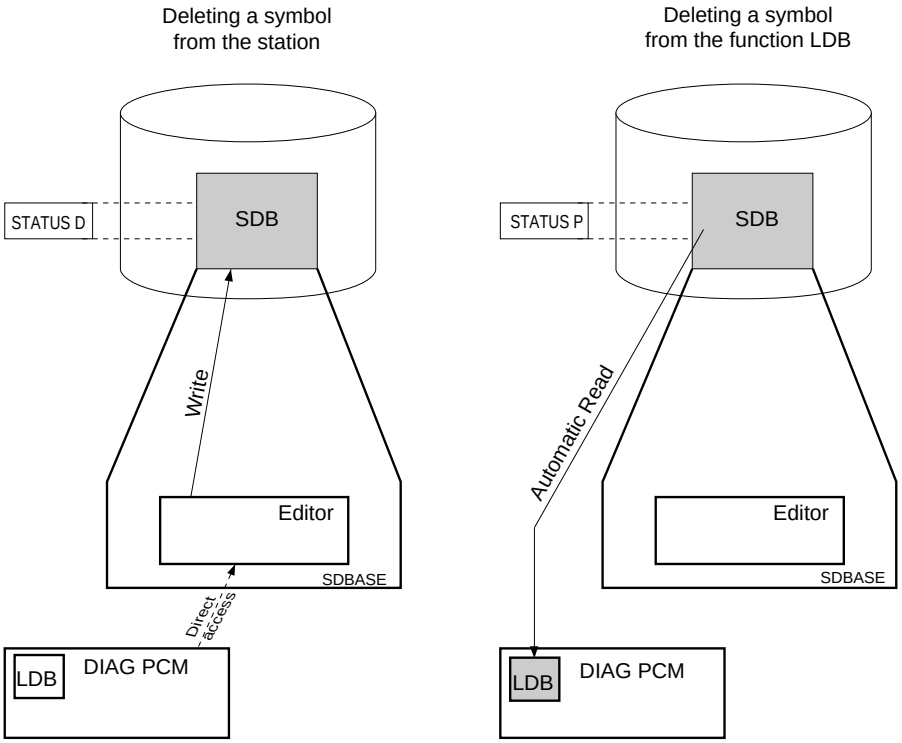
Example of creation from XTEL-SDBASE



- **Deleting a symbol**

  A symbol can be deleted from the SDB using XTEL-SDBASE or a dedicated function. Once this action is performed, if a criteria is defined, it will be assigned **Status D**. The deletion from the LDB assigned to the function only takes effect after the SDB has been read. Once this is complete, **Status P** will be assigned to the symbol.
  The actual deletion of the symbol record from the disk will only take place when the SDB is compacted using XTEL-SDBASE (refer to Sub-section 3.2-8).

  Example:



- **Modifying a symbol**

  The procedure is identical to the symbol creation procedure.

3.2-8 Writing a PL7-2 or PL7-3 Symbol File

XTEL-SDBASE lets the user generate, from the symbol data base, a text file :

- either in standard format (.SCY) containing variables, symbols and comments,
- or in extended format (.SCZ) containing variables, symbols, comments, comment extensions and display base (if base is V5 format)

3.2-9 Symbol Data Base Utilities

- **Save/Restore the base**

  In addition to its working space, XTEL-SDBASE has a back-up storage field that is the mirror image of the working field.

- **Save the base:** This action lets the user copy the contents of the working field to the back-up storage field at any time.
- **Restore the base:**This action lets the user retrieve the contents of the back-up storage field at any time and copy it to the working field.

- **Compact**

  When a symbol is deleted from the data base, its physical record on disk remains. This means that gaps will form in the record stored on disk, thus wasting storage space. The compacting action lets the user recover this lost space by optimizing storage on disk and compact the symbol data base records to reflect the deletions made.

- **Check the coherence:** Displays the data base symbols that are not used by the functions or tools.
- **Copy/Paste the base:** Lets the user copy an existing SDB from one station to another.
- **Delete the base**

  This action lets the user delete all records from the SDB, from both the working and storage fields.

- **Delete text files**

  This is used to delete text files.

- **Select a font**

  This is used to select the font and character size for printing. The accessible fonts are those which are installed under OS/2.

- **Sort data base**

  This action displays the data base in alphabetical order (or following a user selected mask) of the symbols, variables or comments (alphanumeric for the variables).

Points to Remember about XTEL-SDBASE:

It manages station symbols and supports:

- Creation and modification of the SDB by entering new data,
- Creation and modification of the SDB by merging:
  - An SDB from another station,
  - Existing text files,
  - Tools, e.g. XTEL-MOD and XTEL-CAD,
- Display of the SDB contents,
- Automatic call-up from dedicated station functions.

3.3 Accessing the XTEL-SDBASE Tool

The XTEL-SDBASE Tool is accessed:

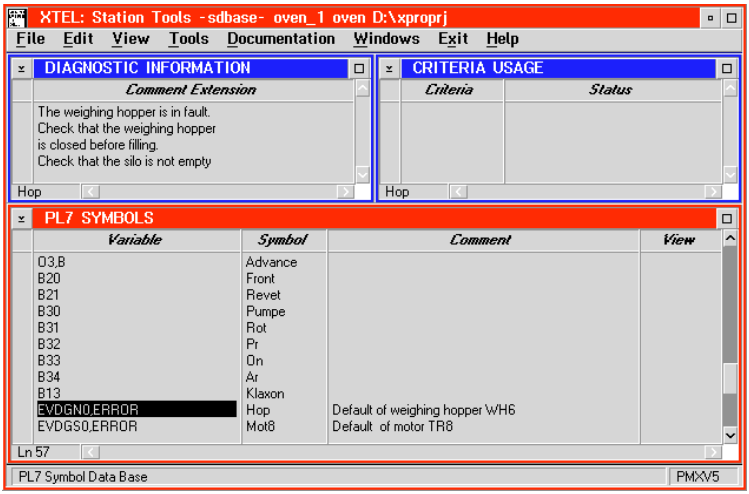
- In the X-TEL Software Workshop: from the Station Tools secondary window in the Station primary window,
- In the MINI X-TEL Software Workshop: from the primary window.

X-TEL

- Select a Volume
  - Select a Project
    - Select a Station
      - Select XTEL-SDBASE from Station Tools

MINI X-TEL

- Primary window
  - Select XTEL-SDBASE from the primary window



This entry screen in sdbase is that of the editor. It has three windows which are used to consult and enter data via a menu bar providing access to the various commands.
The three windows are linked by the symbol field; this means that when the user is positioned on a symbol in the PL7 SYMBOLS window, the content of the DIAGNOSTIC INFORMATION and the USAGE CRITERIA windows automatically correspond with this symbol.
The following overview displays the commands offered by the sdbase editor.

Overview

File

Open
- 1 PL7 Symbol Data Base
- 2 Error Files
- 3 List of Text Files
- 4 Coherence Report

Convert
- Symbol base to text file...
- Text file to symbol base...
- SYMB base to symbol base...

Edit

Copy

Cut

Paste

Insert and Paste

Insert Line

Delete Line

Clear

Cancel

Select Criteria...

Search...

Replace...

View

Start of Base

End of Base

Sort PL7 SYMBOL-IZATION on
- Symbol
- Variable
- Comment

Tools

Compact...

Check coherence

Backup Base...

Restore Base...

Delete Base...

Delete text files...

Copy Base...

Paste Base...

Select a font...

Documentation

Generate...

Consult...

Print...

EnterInformation
- Title Page...
- Footer...

Windows

1 DIAGNOSTIC INFORMATION

2 CRITERIA USAGE

3 PL7 SYMBOLS

Exit

Exit

Resume

Help

Help...

Help Field...

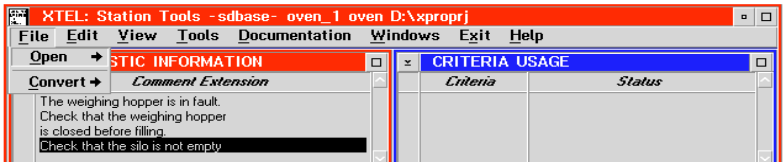
Help Error...

Product information...

D

3.4 File Menu

The **File menu** displays two headings which are used to work on the files or data bases as an entity (open, convert, etc).



Open Used to open a file or a symbol data base

Convert Used to convert the symbol data base to a text file and vice versa.

D

3.4-1 Open Action

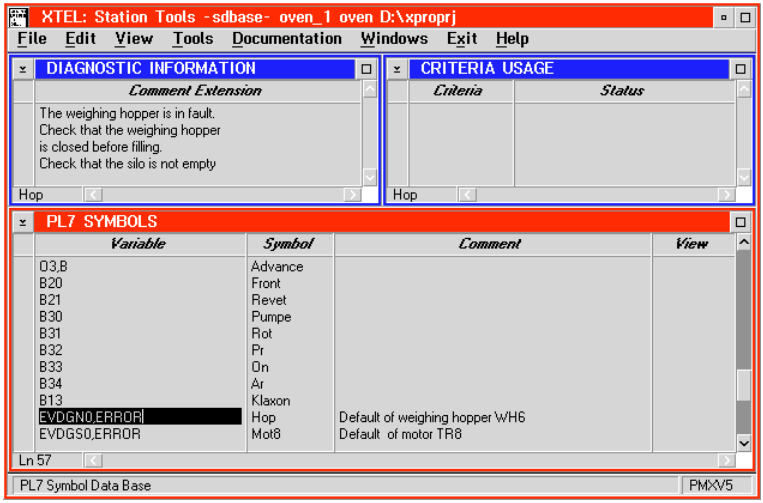
Activation of this function displays a second pull-down menu which is used to select the symbol data base or the file to be opened :

- **1 PL7 Symbol Data Base**
  This opens the PL7 symbol data base. If the PL7 data base is already open, activating this menu closes then re-opens it. The PL7 symbol data base is described on the next page.
- **2 Error Files**
  This displays a dialog box for selecting and opening an error file. These files display any errors which may be generated when merging symbols (data migration from SYMB or from a text file to sdbase) or pasting from a symbol data base. Error files are described on the following pages.
- **3 List of Text Files**
  This displays a dialog box for selecting and opening an .Scy or .Scz text file (with extended comments). Text files are described on the following pages.
- **4 Coherence Report**
  This displays the data base coherence report. This report is generated once data base coherence has been checked via the Tools menu. The corresponding screen is described on the following pages.

If PL7-MMS is present on a station, there is for example :

5 MMS_LOCAL
6 MMS_REMOTE

Description of the PL7 symbol data base



It can be accessed by the user via three windows :

- The PL7 SYMBOLS window, which is used to display the symbol data base, to add symbols or to modify existing symbols. To do this, the following four fields are available. The current line number (highlighted by the cursor) is also indicated at the bottom left-hand corner of the window.

  - **Variable** Used to display or enter objects in PL7-3 language
  - **Symbol** Used to display or enter the symbols assigned to the PL7-3 variables (8 characters maximum)
  - **Comment** Used to display or enter comments assigned to the symbols (32 characters maximum)
  - **View** Used to display or enter a letter which indicates the display format of the variable by the various tools and functions. This field can remain empty, or it can contain the letter B (for Binary coded decimal), D (for Decimal), H (for Hexadecimal), L (for Logic), M (for Message) or F (for Floating point). This field is automatically filled in when certain floating point OFB variables are entered.

  If the symbol assigned to a PL7-3 object has not been entered, it is generated automatically during validation and starts with the character #.

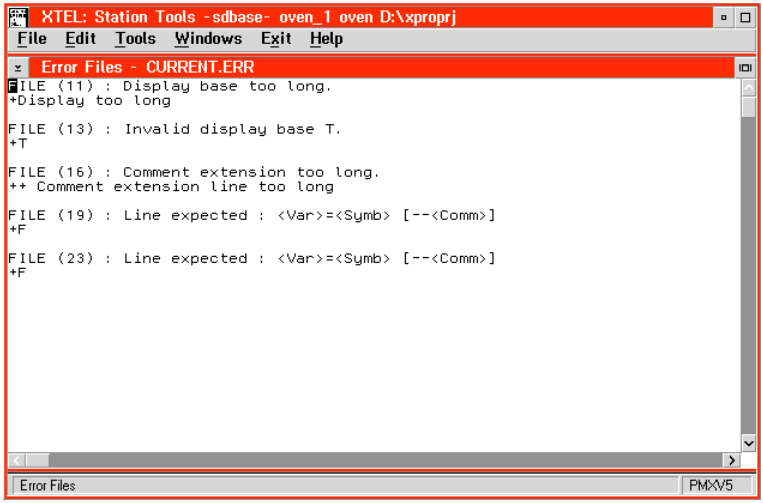
  When entering a variable (W100, for example), the next variable of the same type can be entered automatically (W101) by pressing the <Tab> key when the cursor is highlighting the variable field on the next line.

D

- The DIAGNOSTIC INFORMATION window, which is used to display, enter or modify the extended comments assigned to a symbol. These comments are not restricted in length but are split into strings of 32 characters. They can be used by the diagnostic tools in the software workshop or on an operator dialog terminal. The Comment Extension field displays the extended comment assigned to the symbol selected in the PL7 SYMBOLS window, whose name appears at the bottom left-hand corner of the window.
- The USAGE CRITERIA window, which is used to display the usage criterion (or criteria) assigned to the symbol. It can also be used to set a symbol criterion to DELETE status (denoted by the letter D). To do this, select the line in the USAGE CRITERIA window and use **Edit**/**Delete Line**.
  The **Criteria** and **Status** fields display the information assigned to a symbol, selected in the PL7 SYMBOLS window, whose name appears at the bottom left-hand corner of the window :

- **Criteria** This displays the usage criterion (or criteria) of the symbol whose name appears at the bottom left-hand corner of the window. The DIAGPCM criterion (used by the operator dialog diagnostics function) is available whichever tools and functions are installed in the station. If the symbol is entered from another function (PL7-MMI, for example), it will take on the criteria relating to this function (for example PCM_1 to PCM_4). The PL7-3 criterion is implicit for all the symbols displayed in sdbase and is never displayed.
- **Status** If a criterion appears in the **Criteria** field, **Status** displays the status of the current symbol : N for New (symbol created or modified), D for Deleted (symbol deleted), O for Old, P for Pedalbin.

Description of the error file



The contents of the .Err file immediately indicate the cause of any errors, thus enabling the user to modify them. The format of each line is as follows :

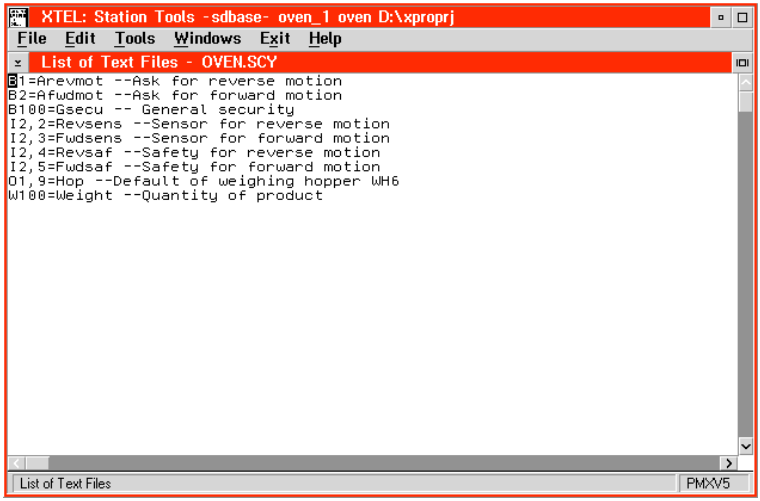
- Name of file or data base (error on line number) : error message

Possible error messages are :

Syntax error	The line in the file to merge has an incorrect format.
Variable too long	The variable name for the indicated line is too long.
Symbol too long	The symbol name for the indicated line is too long.
Comment too long	The comment name for the indicated line is too long.
Invalid variable <name>	The variable name is incorrect.
Invalid symbol <name>	The symbol name is incorrect.
Invalid display base <x>	The display base name is incorrect.
Display base too long	The display base name is too long.
Comment extension too long	The comment extension line comprises more than 32 characters.
Line expected : <Var>=<Symb> [--<Comm>]	The syntax for the indicated line does not correspond with the expected format.

D

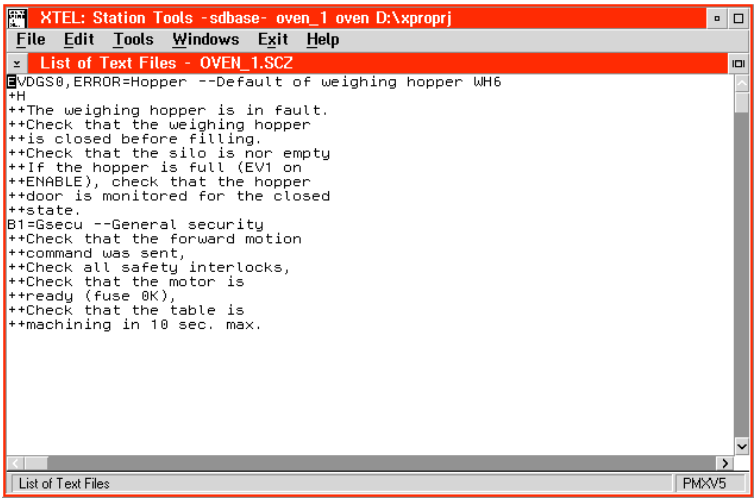
Description of Scy files



An Scy file displays a table of symbols; each line displays the information associated with a symbol (variable, symbol and comment), while maintaining the following format :

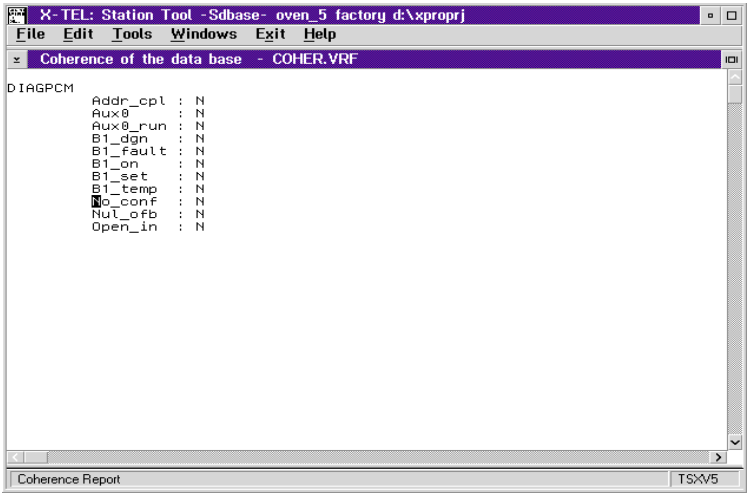
<Variable>=<Symbol> --<Comment>

Description of Scz files



An Scz file displays the same information as an Scy file but also includes for each symbol : the display base (preceded by +) and the extended comment (preceded by ++).

Description of the coherence report



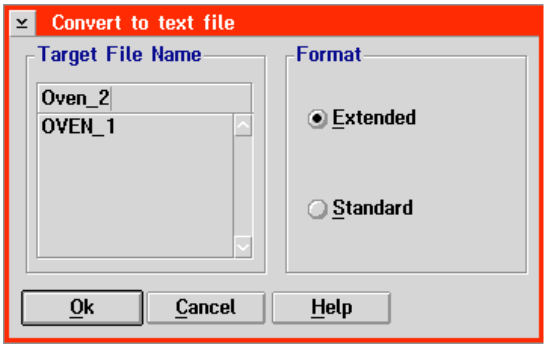
This screen gives the result of the analysis of the current data base in terms of the usage criteria. In the event of incoherence, it displays all symbols whose criteria status is N (New) or D (Deleted). For each criterion, it displays the various symbols which are not read by the function or the tool concerned, as well as the status.

D

3.4-2 Convert Action

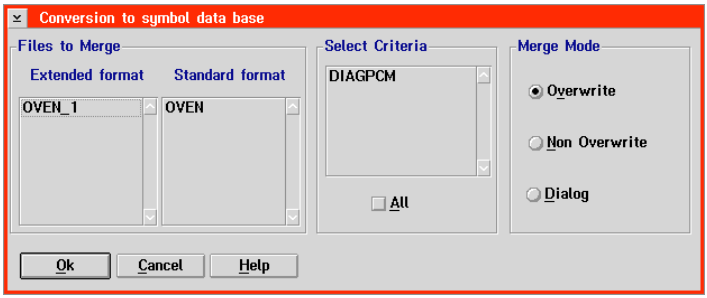
When this function is activated, a second pull-down menu is displayed which is used to select the type of conversion to be performed :

- **Symbol base to text file...**
  This is used to generate, from sdbase, Scy or Scz text files which can be used by other functions (for example PL7-2). To do this, activating this item displays a dialog box which can be used to define the name of the text file and its format : Standard (Scy file) or Extended (Scz file).



The name of the target file can be entered in the appropriate field or selected in the list of files available. In the latter case, or if the name of the file already exists, the contents of the file will be overwritten and replaced by the data in the symbol data base after confirmation by the user.

- **Text file to symbol base...**
  This is used to merge one or several text files into the sdbase. To do this, activating this item displays a dialog box which can be used to select the text files to be imported.



It is possible to select several files to be imported simultaneously, provided that they are all in the same format (standard or extended).

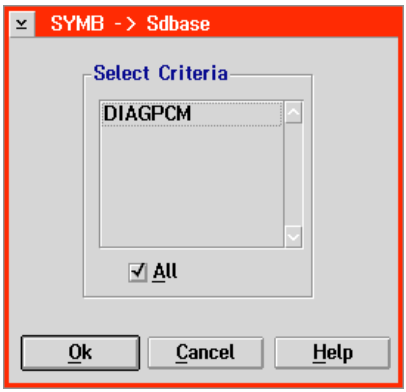
The **Select Criteria** field is used to select the criterion or criteria to be assigned to the imported symbols.

If a symbol or a variable already exist, both in a text file and in the data base, the type of merge is determined by the mode selected :

- **Overwrite** : priority to data from the text file
- **No overwrite** : priority to data from the sdbase symbol data base
- **Dialog** : priority is selected by the user.

If any errors occur during the merge, a dialog box shows the user how to display the corresponding error file (see section 3.4-1).

- **SYMB base to symbol base...**
  This function is only used to transfer a symbol data base created in XTEL-SYMB to the sdbase symbol data base. To do this, activating this item displays a dialog box which is used to select the criteria to be assigned to the symbols contained in XTEL-SYMB and imported into sdbase (All selects all the criteria).

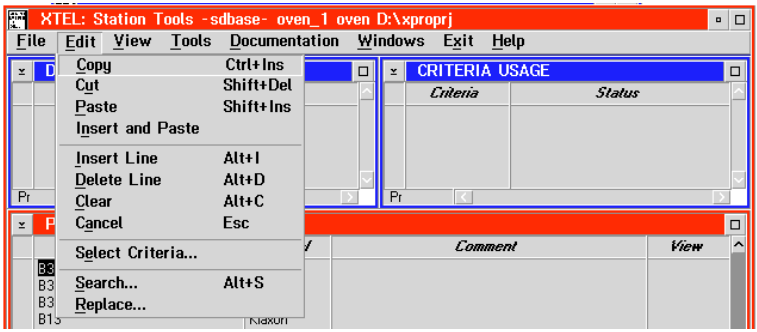


If any errors occur when merging the two data bases, a dialog box shows the user how to display the corresponding error file (see section 3.4-1).

D

3.5 Edit Menu

The **Edit menu** has eleven headings which are used to enter or modify data in the data base.



Copy	Copies the selected data into the clipboard.
Cut	Deletes the selected data and copies it into the clipboard.
Paste	Restores the contents of the clipboard in the position selected by the cursor.
Insert and Paste	Inserts the contents of the clipboard into the data base.
Insert Line	Inserts a blank line.
Delete Line	Deletes the selected lines.
Clear	Deletes the current selection.
Cancel	Cancels an action before it is confirmed.
Select Criteria	Used to define the usage criteria of a symbol.
Search	Used to search for a character string in the data base.
Replace	Used to search for and then replace a string of characters in the data base.

Selecting elements in the data base (with the mouse)

The selected elements are displayed in reverse video :

- To select an element from the variable, symbol, comment or display fields, click on it using the left-hand mouse button.
- To select several elements from a single field (for example, several variables), click on the first element to be selected with the left-hand mouse button, then drag the mouse downwards while holding the mouse button down.
- To select several fields from a PL7-3 object (for example, the variable and the symbol), click on the first field to be selected with the left-hand mouse button, then drag the mouse towards the right while holding the mouse button down. Several PL7-3 objects can be selected by dragging the mouse to the right and downwards at the same time.
- To select an entire line, click on the column header at the left of the window.
- To select all the elements in the data base, click on the box at the top left-hand corner of the window.

  To select all the elements of one or more columns, click on the column header or select several headers by dragging the mouse.
  To make these selections from the keyboard, hold the shift button down and use the cursor keys.

3.5-1 Copy / Cut / Paste / Insert and Paste Actions

These actions are used to move, duplicate or replace elements in the data base :

- either in the current window,
- or in the window with the same name in another symbol data base in the same format (V4 to V4 or V5 to V5). For example, it is possible to copy the content of several fields in the PL7 SYMBOLS window, from the sdbase data base in station 1, to the sdbase data base in station 2.

They work on the selected elements (displayed in reverse video) and can also be accessed by clicking in the selected zone using the right-hand mouse button (PL7 SYMBOLS window).

- **Copy** This copies the selected elements into the clipboard, without overwriting them in the window.
- **Cut** This copies the selected elements into the clipboard and deletes them from the window.
  If one or more complete lines are selected, this function is equivalent to **Copy** plus **Delete Line** (see section 3.5-2). If only the fields are selected, this function is equivalent to **Copy** plus **Delete** (see section 3.5-2).

- **Paste**
  Restores the contents in the clipboard in the position selected by the cursor. **Note that this operation overwrites the elements in the data base and replaces them with those from the clipboard**.
- **Insert and Paste**
  Inserts the contents of the clipboard at the position selected by the cursor. Unlike the Paste action, this operation does not overwrite the elements in the data base - the lines are shifted downwards.

Note

The operations **Copy**/**Paste** or **Copy**/**Insert** and paste result in a duplication of the existing variables or symbols. Thus, to ensure that variables and symbols are unique, they must be modified before they are confirmed.

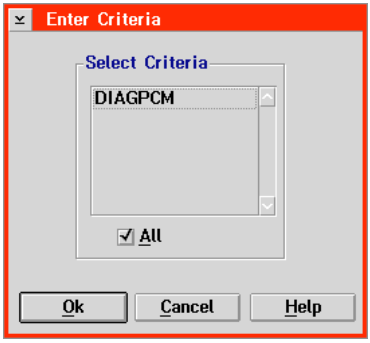
3.5-2 Insert Line / Delete Line / Clear / Cancel Actions

These functions are used to modify the contents of the data base :

- **Insert Line**
  Inserts a "blank" line above the line highlighted by the cursor.
- **Delete Line**
  Deletes all the lines where at least one field is selected.
- **Delete**
  Deletes the selected fields; in other words, deletes their contents. If one or more complete lines are selected, this operation is not equivalent to deleting lines : the contents of the lines are deleted, but the "blank" lines remain.
- **Cancel**
  During an entry or modification, this function is used to cancel an entry before it is confirmed.

3.5-3 Select Criteria Action

This function accesses a dialog box which is used to select the usage criteria of the symbols in the current edit session.



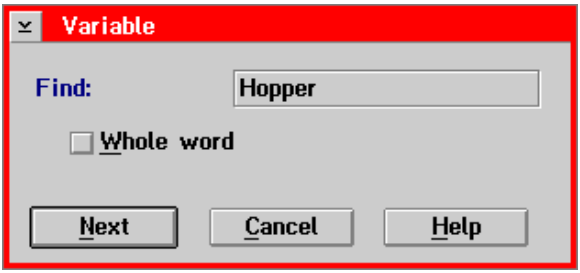
The DIAGPCM criterion (which can be used by the operator dialog diagnostics function) is available whichever functions and tools are installed in the station. The PL7-3 criterion is not displayed, but is assigned implicitly to all the symbols in the data base.

Adding a usage criterion to an existing symbol or variable
A criterion is added by selecting it in the **Enter Criteria** dialog box, and then assigning it to the variables to be modified. To do this, simply add a space to each of the variables concerned. The new criterion is automatically merged with those already present and given the status N.

3.5-4 Search / Replace Actions

These functions are used to search for a character string in the data base and, if necessary, to replace it with another character string. The search or search/replace applies to the selected field (variable, symbol, comment or display).

- **Search**
  This displays a dialog box which is used to enter a character string for which to search. The title of this dialog box displays the field in which the search will be performed : variable, symbol, comment or display. Selecting another field when the dialog box is open modifies the title and thus authorizes the search for the same character string (or another character string) within a new field.
  If the text being searched for does not exist, an error message is displayed on-screen but the dialog box stays open so as to be able to modify the text for which to search.



Whole word If this box is selected, the search is only carried out on whole words.

Next Starts the search from the current position in the selected field. When the first character string (or word) is found, the dialog box stays open and this key starts the search for the next character string.

Cancel Closes the dialog box and thus quits the **Search** function.

- **Replace**
  This displays a dialog box which is used to enter the character string to be searched for and replaced. The title of this dialog box displays the field in which the search will be carried out : variable, symbol, comment or display. Selecting another field when the dialog box is open modifies the title and thus authorizes the search of the same character string (or another string) in the new field.
  If the text being searched for does not exist, an error message is displayed on-screen but the dialog box stays open so as to be able to modify the text for which to search.
  If the text being searched for exists, it is highlighted in the current field and this key can then be used.

Whole word If this box is selected, the search is only carried out on whole words.

Next Starts the search from the current position in the selected field. When the first character string (or word) is found, the Replace key can be used. The user can then press either the Next key and start a new search, or the Replace key.

Replace Replaces the character string being searched for with the entry made in the field **Replace with**. Once the string has been replaced, this key becomes inactive.

Cancel Closes the dialog box, thus quitting the **Replace** function.

D

Notes

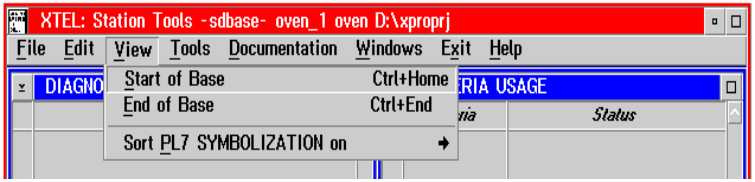
If, after the search for a character string, but before its replacement, the user deletes the line in the current field, modifies or deletes the current field, moves around within the data base or modifies the character string for which to search and replace, the **Replace** key becomes inactive.

To perform a fast search and replace on the same piece of text in the current field, simply press the <**Enter**> key repeatedly which activates the **Next** and **Replace** keys alternately.

It is possible to use the wildcard characters * and ? to search for and/or search/replace a character string. For the search/replace function, each * or ? character in the string being searched for must correspond with the same * or ? character in the replacement string. The ? character corresponds to a single character and the * character corresponds to several characters, which can possibly be "empty". If the rules for using these wildcard characters are not observed, an error message will be displayed on-screen.

3.6 View Menu

The **View menu** has three headings which are used to move within the data base and sort it in alphabetical order.



- **Start of Base**
  Positions the cursor in the variable field of the first element in the data base.
- **End of Base**
  Positions the cursor in the variable field of the last element in the data base.
- **Sort PL7 SYMBOLIZATION on**
  When this function is activated, a second pull-down menu is displayed which is used to select the field which will serve as a reference for the sort :

- **Symbol** The data base is sorted according to the alphabetical order of the symbols.
- **Variable** The data base is sorted according to the alphabetical order of the variables.
- **Comment** The data base is sorted according to the alphabetical order of the comments.

The * or ? characters can be entered in the search.

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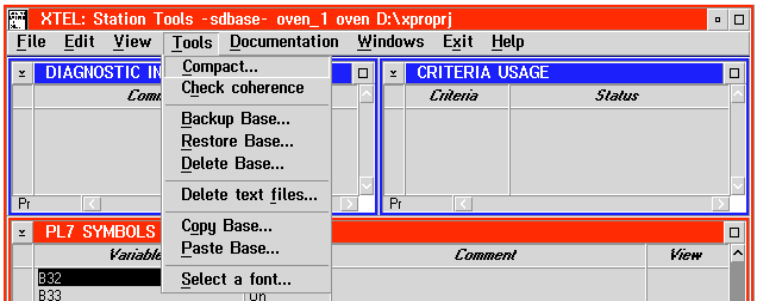
3.7 Tools Menu

The **Tools menu** has nine headings which can be used to manage the data base globally, regardless of its content.



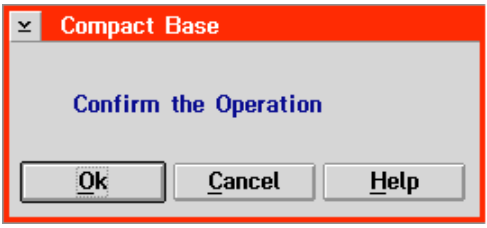
Compact	Compacts the data base.
Check coherence	Starts the analysis of the data base according to the usage criteria.
Backup Base	Saves the current data base.
Restore the base	Restores the data base saved previously.
Delete Base	Deletes the data base from the station.
Delete text files	Deletes one or more text files from the station.
Copy Base	Stores the current station data base.
Paste Base	Restores the data base stored previously using the copy operation, to a target station.
Select a font	Selects the screen font used to display the current data base.

D

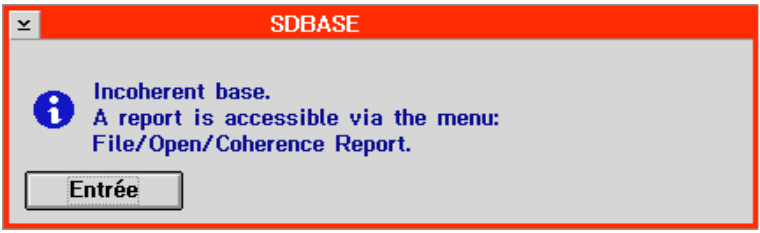
3.7-1 Compact / Check Coherence Actions

These actions are used to optimize the data base once all entries or modifications have been made :

- **Compact**
  When a record is deleted, it is logically absent but remains physically present on the disk. This causes a loss of storage space. The compact action therefore physically deletes those records which are no longer required and re-indexes the data base. This re-indexing means it is possible to insert new lines into the symbol data base.
  To do this, activating the **Compact** action accesses a dialog box which is used to start the compacting operation (**OK** key).



- **Check coherence**
  When activated, this action analyses the current data base at the usage criteria level. It checks whether any symbols have not been recognized by the tools or functions. In the event of any incoherence, a dialog box is displayed to show the user that a report of this analysis is available and can be accessed using the **File/Open/Coherence report** commands.



  For each of the usage criteria, the coherence report file displays the symbols which have not been read by the function or tool concerned, as well as their status (see section 3.4-1).

3.7-2 Backup Base / Restore Base / Delete Base Actions

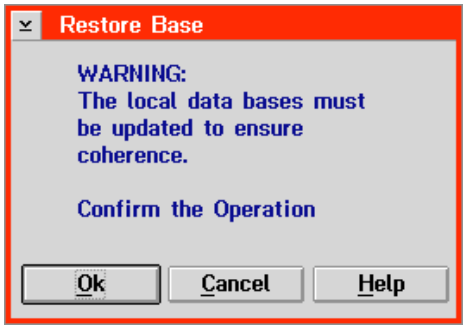
These actions are used to store the current data base and to restore and delete the data base contents :

- **Backup Base**
  When this action is activated, a dialog box is displayed which is used to define the data base save mode.

Immediate Save If this is selected, **OK** results in an immediate copy of all the data base files from the Application directory to the Save directory.

Save on Exit If this is selected, the data base will be saved automatically when the user exits sdbase : the data base files are copied from the Application directory to the Save directory. **OK** is used to save this selection and quit the dialog box.
If this type of save is selected, the user can still request immediate saves without deactivating the save on exit.

- **Restore Base**
  When this action is activated, a dialog box is displayed which is used to confirm restoration of the previously saved data base.



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- **Delete Base**
  When this action is activated, a dialog box is displayed which is used to select the work space in which all the data base files will be deleted (Application directory and/or Save directory).

Application Directory If this is selected, **OK** deletes all the data base files in the Application directory.

Save Directory If this is selected, **OK** deletes all the data base files in the Save directory.

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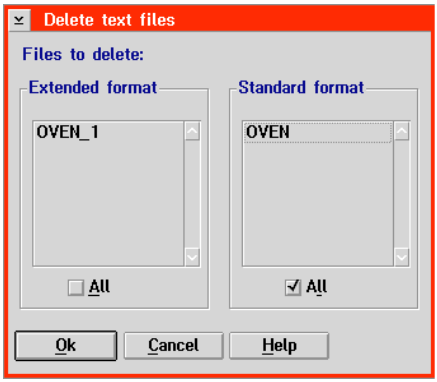
3.7-3 Delete Text Files Action

This action accesses a dialog box which is used to select the text file(s) to be deleted from the hard disk (xproprj\.....\pl7_3\mod directory).

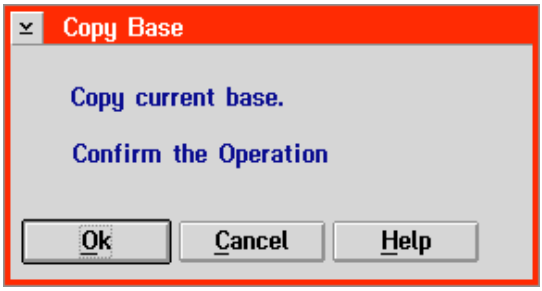


OK deletes the selected files : Scy (standard format) and/or Scz (extended format). If the **All** box is ticked, all files in a given format are selected (see section 3.4-1).

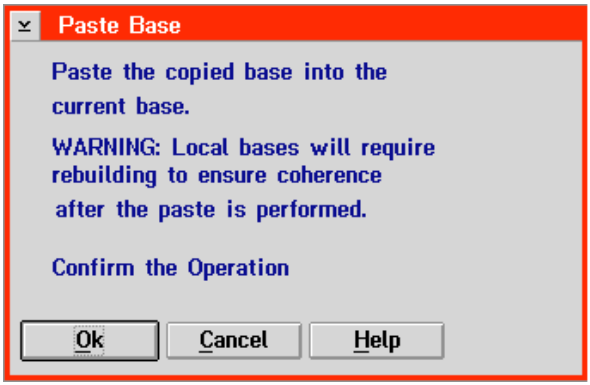
3.7-4 Copy Base / Paste Base Actions

These actions are used to store the current station data base and then copy it to another station.

- **Copy Base**
  When this is action is activated, a dialog box is displayed which is used to confirm storage (**OK** key) of the current station data base.



- **Paste Base**
  If a data base has been copied in a particular station, this action is used to restore it in the current data base. Data which is not valid for the target data base will be shown in the error file (see section 3.4-1). Note : pasting overwrites the current data base.



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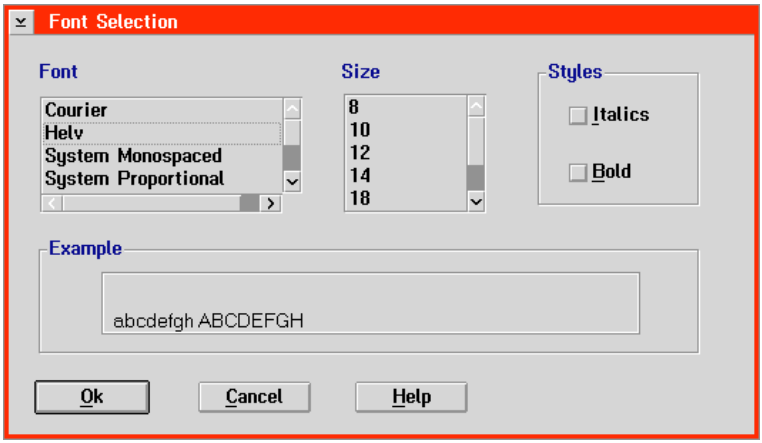
3.7-5 Select a Font Action

This action accesses a dialog box which is used to modify the data base screen font.



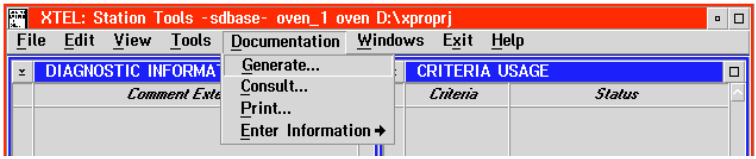
Font Used to select a new screen font from the choice offered by the system.

Size Used to define the size of the selected screen font.

Style Used to italicize (if Italics box is ticked) and/or bolden (if Bold box is ticked) the characters displayed on-screen.
The name of the various fields of the data base (Variable, Symbol, Comment Extension, Status, etc) is always displayed in italics. However, it can also be inbold.
The window names (PL7 SYMBOLS, etc) are not affected by the selected character font.

3.8 Documentation Menu

The **Documentation menu** has four headings which are used to create, consult and print a documentation file.



Generate Generates the documentation file so that it can be consulted or printed.

Consult Used to consult the documentation file previously generated.

Print Used to print the documentation file previously generated locally.

Enter Information Used to enter a title page and footer for customizing the documentation file.

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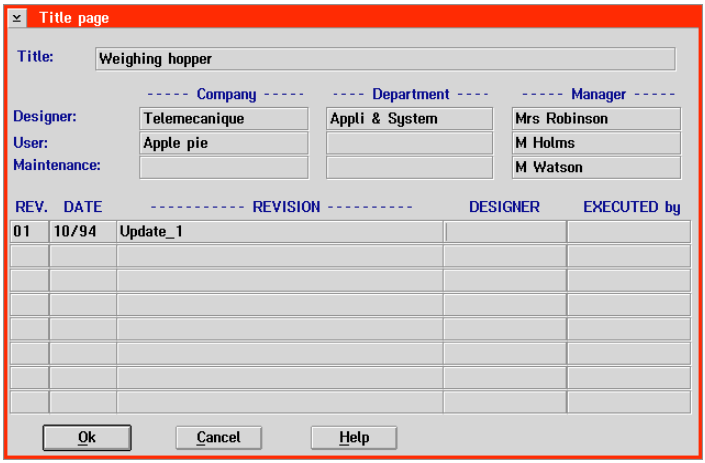
3.8-1 Enter Information Action

When this action is activated, a second pull-down menu appears which is used to define the title page for the documentation file as well as the footer displayed at the bottom of each page of the file being consulted or printed.

- **Title page**
  This accesses a dialog box which is used to enter the title page of the documentation file. The title page, which also serves as a header for the file, is used to define general information concerning the sdbase data base. Once the information entered has been confirmed, it is saved in a .TIT file.
  An entry field on the title page is accessed by clicking into it with the mouse. If the keyboard is being used, the entry fields can be accessed using the <Tab> and cursor keys.



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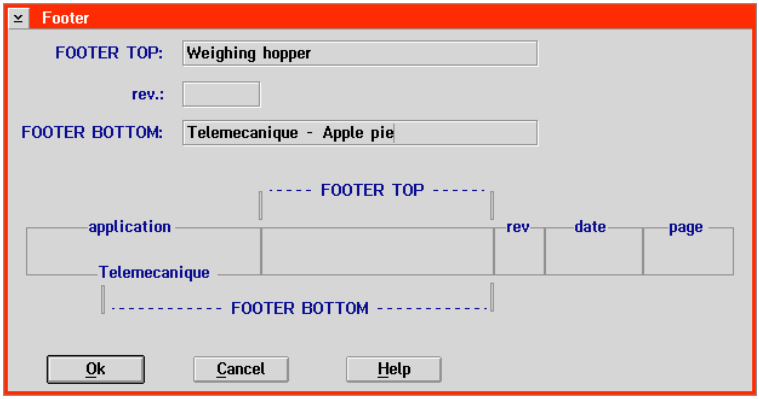
Title	Application title (64 characters maximum).
Company	Company Name (16 characters maximum) : Designer, User and Maintenance.
Department	Department or Services (16 characters maximum) : Designer, User and Maintenance.
Manager	Manager's Name (16 characters maximum) : Designer, User and Maintenance.
REV.	Project revision level (3 characters maximum).
DATE	Project revision date (8 characters maximum).
REVISION	Project revision comment (32 characters maximum).
DESIGNER	Project revision designer (12 characters maximum).
EXECUTED by	Programmer's Name (12 characters maximum).

- **Footer**
  Accesses a dialog box which is used to customize the footer appearing at the bottom of each page of the documentation file when it is consulted or printed. Once the information entered has been confirmed, it is saved in a .CRT file.



FOOTER TOP	Used to enter the contents of the FOOTER TOP, shown in the above example (25 characters maximum).
rev	Used to enter the project revision index (version) (3 characters maximum).
FOOTER BOTTOM	Used to enter the contents of the FOOTER BOTTOM, shown in the above example (45 characters maximum).

In addition to the information entered in this dialog box, the footer at the bottom of the page gives the following information :

- Application name (25 characters maximum)
- Document version number (1 character)
- Description of the section printed (45 characters maximum)
- Date of the print-out, generated automatically
- Page numbering within each section, generated automatically
- Absolute page numbering, generated automatically.

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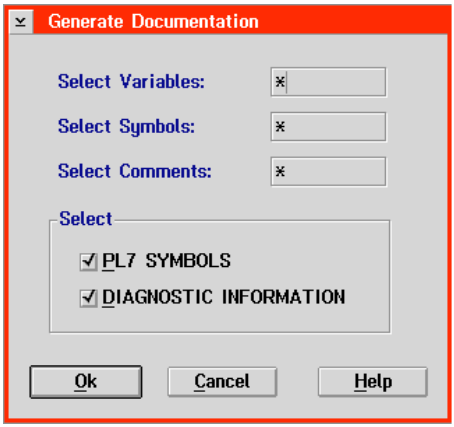
3.8-2 Generate Action

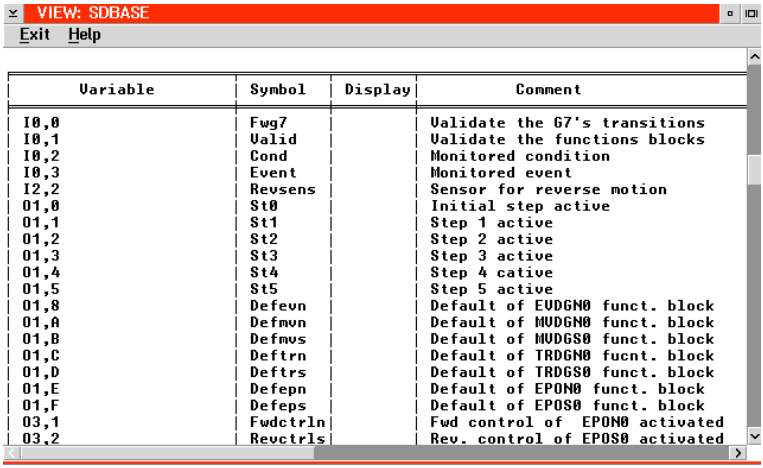
Once all the data in the symbol data base, the title page and the footer have been entered, the Generate action displays a dialog box which is used to generate the documentation file relevant to the application.
After each modification made to the symbol data base, the title page or the footer, the user must re-select the Generate action for the file update to become effective.
The dialog box is used to select the variables, symbols or comments to be included in the documentation.



- **Select Variables / Select Symbols / Select Comments**
  These 3 entry fields are used to make a selection using a sort mask on the appropriate data base fields (taking into account upper and lower case characters). These masks can include wildcard characters :
  - **?** replaces any character,
  - ***** replaces any character string.
- **Selection**
  This is used to select the data presentation format : PL7 SYMBOLS (variable/symbol/display/comment) and/or DIAGNOSTIC INFORMATION (variable/symbol/extended comment).

3.8-3 Consult Action

Once the documentation file has been generated, this function displays it on-screen. The scroll bars (or Page up/Page down keys) are used to display all items in the file.



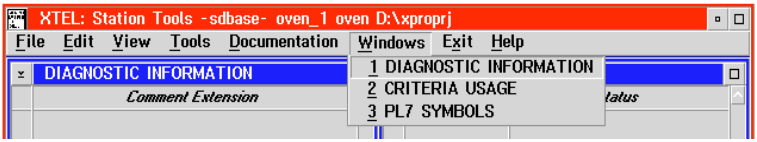
Exit Exits the documentation file view screen.

3.8-4 Print Action

Once the documentation file has been generated, this function is used to print it locally. When the **Print** function is activated, a dialog box is displayed which is used to select the printer to which the file will be printed from the list of all the printers configured in the system.

3.9 Windows Menu

The **Windows menu** has three headings which are used to select the active window. This menu is really only useful if using the keyboard (<F10> and cursor keys). To select a window using the mouse, the user simply clicks on it.



- **1 DIAGNOSTIC INFORMATION**
  Activates the DIAGNOSTIC INFORMATION window.
- **2 CRITERIA USAGE**
  Activates the USAGE CRITERIA window.
- **3 PL7 SYMBOLS**
  Activates the PL7 SYMBOLS window.

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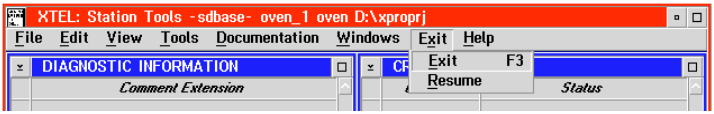
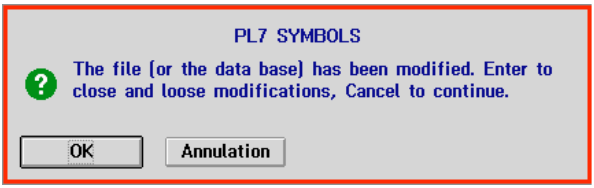
3.10 Exit Menu

The **Exit menu** has two headings which are used to quit sdbase or return to the data base.



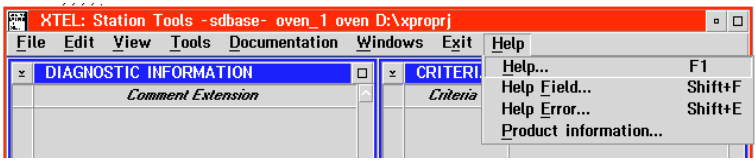
Exit (or <**F3**>)
This is used to quit sdbase. If modifications to the data base have not yet been confirmed, the following message is displayed. **Cancel** is used to return to the data base and confirm them.



Resume
Returns to the data base.

3.11 Help Menu

The **Help menu** has four headings which are used to access the various contextual Helps in sdbase. The user can return to the current sdbase screen by pressing <**X**>.



- **Help**
  Accesses the sdbase general Help.
- **Help Field**
  Accesses the Help for the field highlighted by the cursor (Variable, Symbol, Criterion, etc).
- **Help Error**
  Accesses the error message when an error occurs.
- **Product Information**
  Displays the following dialog box which indicates which version of sdbase software is being used. **OK** hides the dialog box.

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3.12 Compatibility

TXT L BASE V4 --> TXT L BASE V52 Compatibility
All symbol data bases created by XTEL-SYMB in a TXT L BASE V4 Software Workshop can be read and modified in a TXT L BASE V52 Software Workshop.

To do this, migrate the symbol data base to sdbase format using the Merge action, which is accessed via **File/Convert/SYMB data base to symbol data base**.

TXT L BASE V42 or V43 --> TXT L BASE V52 Compatibility
All symbol data bases created by X-TEL-SDBASE in a TXT L BASE V42 or 43 Software Workshop can be read and modified in a TXT L BASE V52 Software Workshop.

For TSX 17/27/47 type stations, to read the data base, simply open it.

For TSX V4 level stations, the data base must first be compacted using the Compact action accessed from the **Tools** menu.

TXT L BASE V52 --> TXT L BASE V42 or V43 Compatibility
All symbol data bases created by XTEL-SDBASE in a TXT L BASE V52 Software Workshop can be read and modified in a TXT L BASE V42 or 43 level Software Workshop.

For TSX 17/27/47 type stations, to read the data base, simply open it.

For TSX V4 level stations, the PL7-3 criterion will have to be regenerated. To do this, select save/restore, then :

- Extract the data base into an SCY file (menu **File/Convert/Symbol data base to text file**) in a TXT L BASE V52 Software Workshop,
- Merge the SCY file **with the PL7-3 criterion** in a TXT L BASE V42 or 43 level Software Workshop.

If the station, the project, or the volume containing the data base have been purged in the Software Workshop, it is necessary to reopen Sdbase and the PL7 symbol data base before changing from a V52 Software Workshop to an earlier version (purging : Purge command in the contextual menu of a corresponding icon).

4.1 Presentation

The **XTEL-CONTROL** tool is a station level operating tool. It runs on-line and monitors the operating modes of a TSX or PMX Series 7 PLC.
Before running, the program checks that the selected programming port, MAPWAY, UNI-TELWAY or FIPWAY/FIPIO driver is present. The request to connect to the PLC will be rejected if the access rights of the user are inadequate. Access rights of at least Adjust Max. are required.
XTEL-CONTROL can be used with **any Telemecanique Series 7 PLC** from TSX 17-10 to TSX/PMX 107-455.

4.2 Functions

4.2-1 Connection to the PLC

XTEL-CONTROL establishes connection with the required PLC.

Note:
If direct connection with the PLC is selected, connection will only succeed if less than three programs simultaneously access the programming port. In addition, if XTEL-CONTROL is executed, two other programs can also access the programming port.

- **PLC status display**
  XTEL-CONTROL provides first level diagnostics functions by showing a display of the PLC front panel LED indicators.

○ RUN	PLC status LED,
○ CPU	PLC error LED,
○ MEM	PLC memory error LED (1),
○ I/O	I/O error LED (1),
○ FIP	Built-in FIPWAY/FIPIO or UNI-TELWAY interface status LED (1). When UNI-TELWAY is supported, the marking FIP on the front panel is replaced with UTW (2).

The indicator data is refreshed every second.

(1) There are two states: Red LED lit when an error condition occurs or off during normal operation. The FIP indicator LED blinks to indicate a mild error condition, one that does not require manual intervention (double address, missing terminal block, etc.).

(2) For all PLC processors with built-in support for FIPWAY/FIPIO or a built-in UNI-TELWAY interface and software version V4.3 or higher.

4.2-2 PLC Control

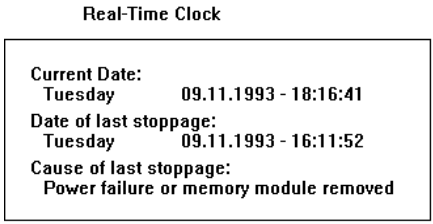
XTEL-CONTROL is accessible at station level and acts on PLC operating modes.

RUN	Application program execution command,
STOP	Application program stop command,
INIT	PLC initialization

4.2-3 Viewing and Adjusting the Real-Time Clock

XTEL-CONTROL lets the user display and modify the time and date settings for the PLC processor real-time clock. It also displays the time, date and cause of the last PLC stoppage.

D



Points to remember about XTEL-CONTROL

- Station level display of the PLC front panel LEDs,
- PLC control,
- Displays and modifies PLC real-time clock settings.

4.3 Accessing the XTEL-CONTROL Tool

The XTEL-Control Tool is accessed:

- In the X-TEL Software Workshop: from the Station Tools available to manage a station in the X-TEL Software Workshop,
- In the MINI X-TEL Software Workshop: from the primary window.

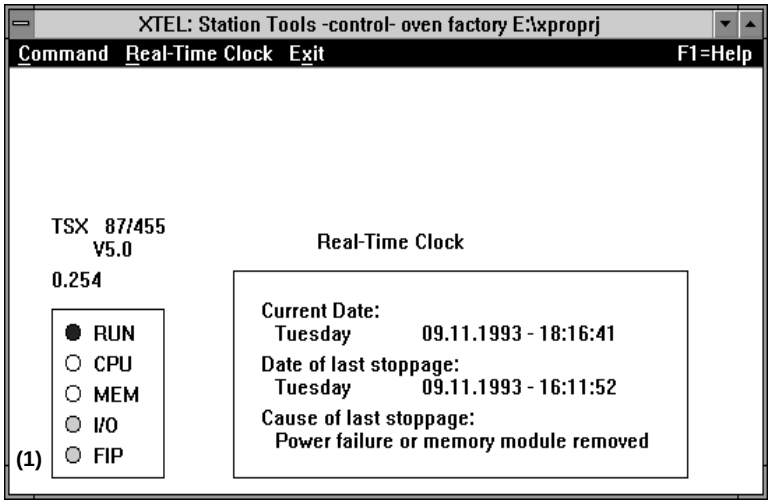
X-TEL

Select a Volume
→ Select a Project
→ Select a Station
→ Select the XTEL-CONTROL Tool in Station Tools

MINI X-TEL

Primary window
→ Select XTEL-CONTROL in the primary window

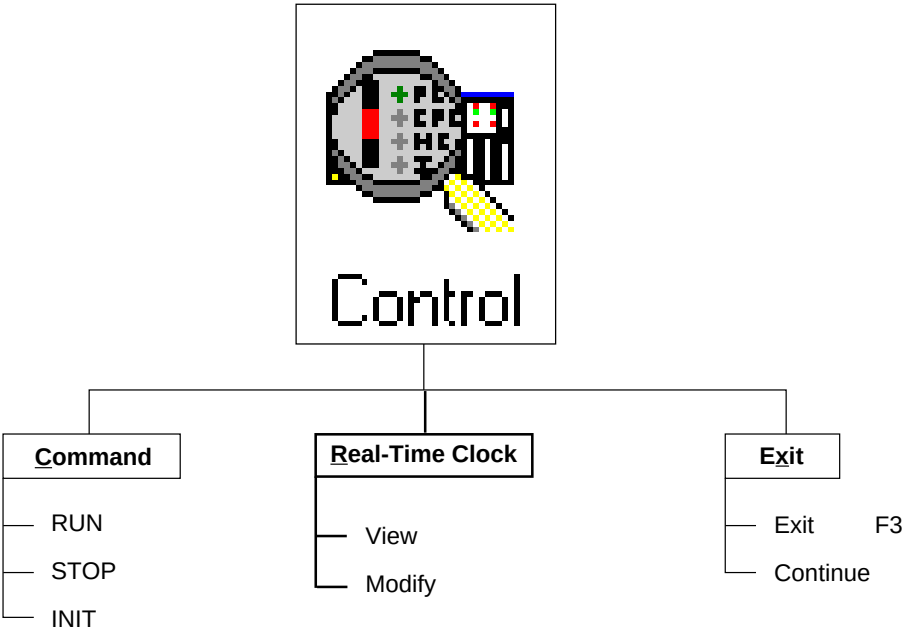
Primary window



The XTEL-CONTROL primary window lets the user select an action to perform from one of the three menus that can be accessed from the action bar.

(1) Only with a PMX P... or TSX P... processor with built-in support for UNI-TELWAY and software version 4.3 or higher. The FIP marking will be replaced with UTW if the PLC processor has built-in support for FIPWAY/FIPIO.

Diagram


Control
Command
RUN
STOP
INIT
Real-Time Clock
View
Modify
Exit
Exit F3
Continue

4.4 Command Menu

4.4-1 Run - Stop - Init Actions

RUN Action
This action, once confirmed by the user, starts execution of the application program in the PLC. The PLC starts running and the RUN indicator LED comes on. This action is dimmed if the PLC is already running or if a DEF/MEM condition is present.

STOP Action
This action, once confirmed by the user, stops execution of the application program in the PLC. The PLC is stopped and the RUN indicator LED goes off. This action is dimmed if the PLC is already stopped or if a DEF/MEM condition is present.

INIT Action
This action, once confirmed by the user, reinitializes a PLC application. This action is only available if the PLC is stopped, even if a DEF/MEM condition is present.

The INIT action is identical for all PLCs in the TSX Series 7 range and reinitializes an application.
This has the same effect as the INIT command in PL7-2 or PL7-3.

For example, on PLCs using PL7-3 reinitialization causes the following actions:
- Program initialization,
- Application variables reset to zero,
- Grafcet reinitialization,
- System bit SY0 set to 1.

Remark

The RUN, STOP or INIT functions reserve the PLC:
- Only when PL7-3 is used with TSX/PMX V4 and V5 stations,
- Exclusively for all other types of station.

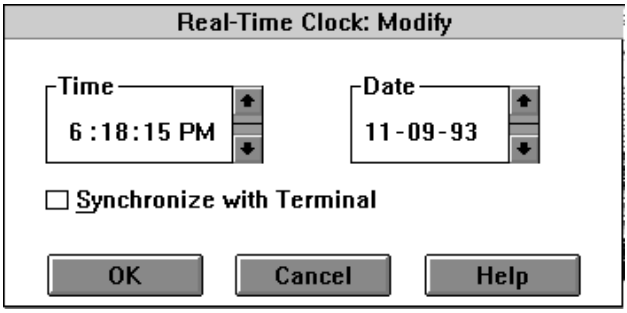
4.5 Real-Time Clock Menu

4.5-1 View Function

This function lets the user choose to display or hide the real-time clock information field in the XTEL-CONTROL primary window. By default, the real-time clock information field is displayed.

4.5-2 Modify Function

This function lets the user modify the settings of the real-time clock. The following dialog box is displayed.



To modify the time or the date:

- Click on the value to modify,
- Enter the new value or click on the arrows to increment or decrement the value.

The "Synchronize with Terminal" lets the user set the time and date to match that of the station being used.

OK Confirms the modifications made in the dialog box and returns the user to the primary window.

Cancel Aborts the modifications made and returns the user to the primary window.

4.6 Error Messages

Cannot access Communication Driver

Probable cause	Corrective action
The PLC is not connected.	Connect the PLC.
The PLC cannot be accessed.	Check probable causes (PLC powered-down, PLC failure, etc.).
Communication attempted via the programming port of the PLC while more than three simultaneous activities are running.	Reduce the number of simultaneous activities.

Once this message is displayed, XTEL-CONTROL is stopped.

Cannot reserve the PLC, or PLC already reserved

Probable cause	Corrective action
An attempt to reserve the PLC failed.	Check that the PLC is not already reserved by another function.

Error reading processor description files: <file specification>
These files are missing from the installed configuration."

Probable cause	Corrective action
XTEL-CONTROL cannot find the processor description in the X-TEL installation.	Acknowledge the message. XTEL-CONTROL is then closed. Check your X-TEL configuration.

Error reading processor description files: <file specification>
None of these files comprise the processor code read from the PLC: <code read>

Probable Cause	Corrective Action
The processor description files cannot be used in the X-TEL installation.	Acknowledge the message. XTEL-CONTROL is then closed. Check your X-TEL configuration.

Inadequate access rights

Probable cause	Corrective action
The user has inadequate access rights.	Minimum access rights are Adjust Max.

No response from the accessed PLC

Probable cause	Corrective action
An attempt to read PLC processor status failed.	Check PLC status or definition.

D

The user must respond by selecting Abort, Retry or Ignore.

The Abort choice stops the XTEL-CONTROL tool and returns the user to X-TEL.

The Retry or Ignore choices let the system repeat the attempt to access the PLC and continue XTEL-CONTROL activity.

Station defined as: xxxx. The PLC connected is different

Probable cause	Corrective action
A type xxxx station is defined and the connected PLC is different.	Change the station definition.

When this error message is displayed, XTEL-CONTROL is stopped and the user is returned to X-TEL.

5.1 Presentation

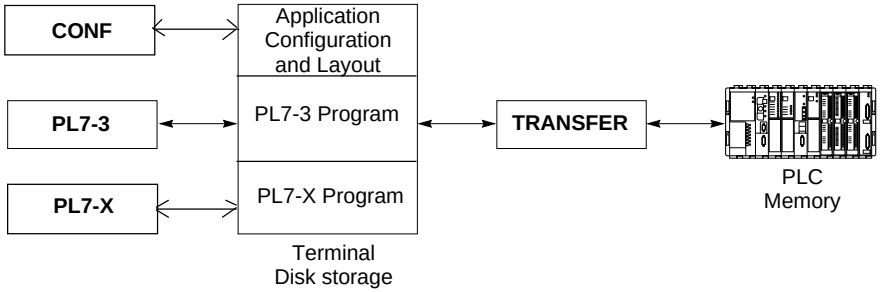
The XTEL-TRANSFER tool is a station level operating program that operates on-line only with TSX Series 7 Model 40 V5 level PLCs. It handles transfer and updating of the complete application or only of a part of it (i.e. transferring the PL7-COM function from an application that comprises PL7-3, PL7-AXE and PL7-COM).

To run, the program requires at least one of the following drivers: programming port, MAPWAY, ETHWAY, UNI-TELWAY or FIPWAY/FIPIO. The transfer request will be refused if the user's access rights are inadequate. Access rights of at least Adjust max. are required.

5.2 Functions

- **Station program transfer presentation**
  Two-way transfer is effective on all or part of the station application:
  Disk to PLC memory
  PLC memory to Disk.

  Diagram



  During the transfer, the program reserves the entire capacity of the PLC.
  Transfer does not however require the full processing capacity of the station and it can be performed in the background so that other tasks or programs can continue to be executed in the foreground.

- **Transfer from Disk to PLC Memory**
  This transfer stops execution of the PLC program. Any program in the PLC memory is overwritten by the program transferred from Disk.
  The application layout and/or program binary files on disk are transferred to the PLC memory.

- **Transfer from PLC Memory to Disk**
  All of the application programs transferred to the disk located in the terminal can then be accessed by the various tools and functions.
  The application layout file in the PLC memory is transferred to the .APP directory of the station. The binary files are transferred to the directories used by the various PL7-X functions in the station.

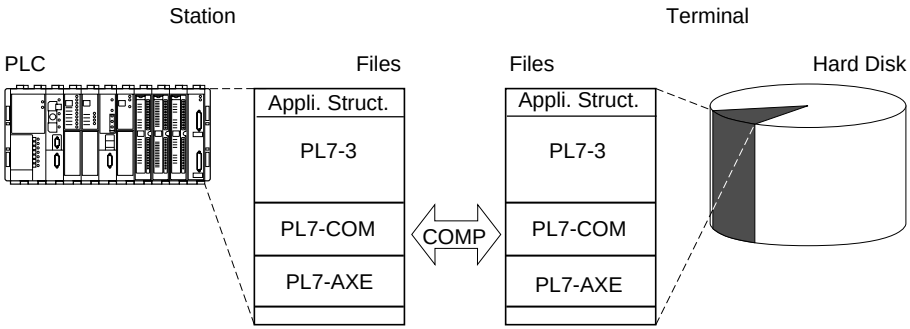
- **List of configured functions**
  This action displays, without performing any program file transfers, the dedicated functions used in the application.

  For each function the program displays the following information:
  - Date of the last modification made,
  - Application comments.

- **Comparing application programs**
  This action compares the application stored in the PLC memory with the application stored on-disk in the terminal.

  It can be performed in two stages if required:
  - Comparison of the application layout and binary files on disk in the terminal with those in the PLC memory,
  - Partial update of the application on disk if a difference is found between the files.

Diagram



Comparison execution

- Complete application comparison:
  This is the first phase of the comparison. The program checks that the configured fields are identical and that they have the same assigned sizes.
  For example in the diagram shown on the previous page, there are four identical fields.
- Function level comparison:
  This second phase of the comparison is only performed if the memory layout is identical. The comparison checks the date of the last modification of the binary data in the selected field.

The date is automatically stored each time any modifications are made to the binary codes. The date is taken from the real-time clock in the PLC when on-line or from the terminal clock when local mode operation is selected.

The date serves as an indication of the program development level.

Partial update

Partial update of the application on disk is done after a comparison of the program. It can be performed if the configured fields and their assigned sizes are identical. Any difference must be at function level.
The user is free to decide on whether or not to update the corresponding functions. The files transferred update the corresponding functions in the binary files.

Points to Remember about XTEL-Transfer (for V5 level stations):
- Two-way transfer of all or part of the application,
- List of configured functions,
- Comparison of application programs,
- Identification of differences and partial updating.

5.3 Accessing the XTEL-TRANSFER Tool

The user can access the XTEL-Transfer Tool:

- In the X-TEL Software Workshop: from the station tools available for managing a TSX V5 or PMX V5 station in the X-TEL Software Workshop,
- In the MINI X-TEL Software Workshop: from the primary window.

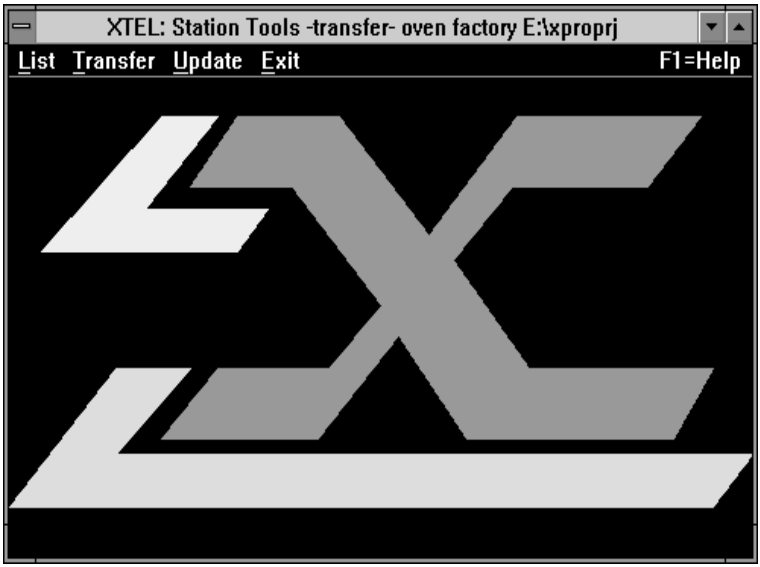
X-TEL

- Select a Volume
  - Select a Project
    - Select a Station
      - Select the XTEL-TRANSFER Tool in Station Tools

MINI X-TEL

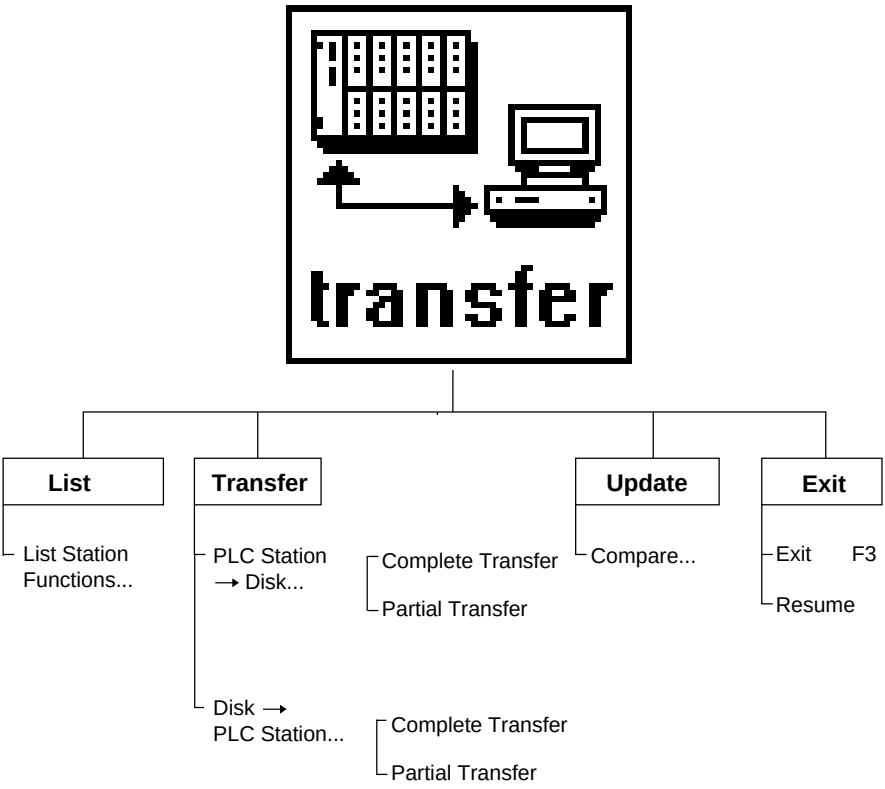
- Primary window
  - Select XTEL-TRANSFER in the primary window

Primary window



The primary window of the XTEL-TRANSFER tool lets the user select an action to perform from one of the five menus available via the action bar.

Diagram

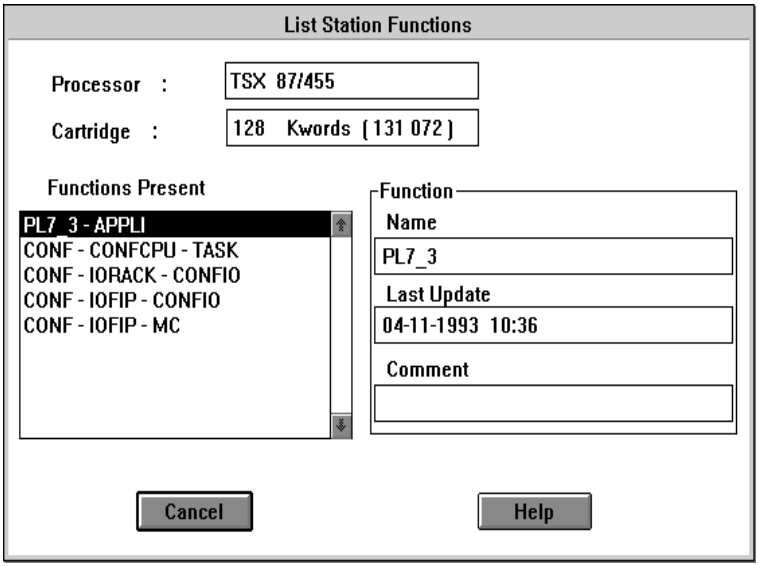

transfer
List
List Station Functions...
Transfer
PLC Station → Disk...
Complete Transfer
Partial Transfer
Disk → PLC Station...
Complete Transfer
Partial Transfer
Update
Compare...
Exit
Exit F3
Resume

D

5.4 List Menu

5.4-1 List of Station Functions Action

The list action lets the user determine the processor type, memory cartridge size and the functions configured for a selected station. No transfer is performed, only the status of the PLC configuration at function level is displayed.



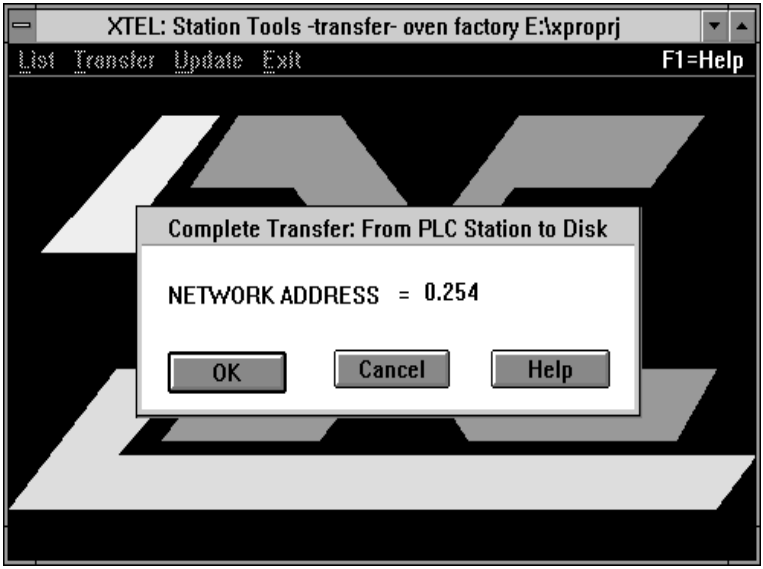
The list of functions configured for the station is displayed. The “Last update” and “Comments” fields relate to the selected function.
If a function is declared in the application but not loaded in the PLC station, the “Last update” and “Comments” fields are not filled-in.

Cancel Returns the user to the XTEL-TRANSFER tool primary window.

5.5 Transfer Menu

5.5-1 PLC Station → Disk ⇒ Complete Transfer Action

This action lets the user download the entire application from the PLC memory to the disk in the terminal.



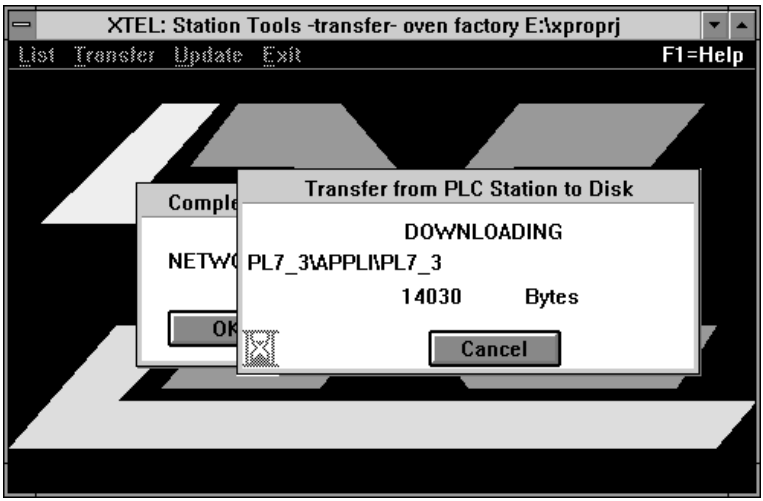
A confirmation screen reminds the user of the direction of the selected transfer and the complete (Network.Station) address of the station with which communication is established.

OK Starts the transfer,

Cancel Cancels the transfer request and returns the user to the XTEL-TRANSFER primary window.

D

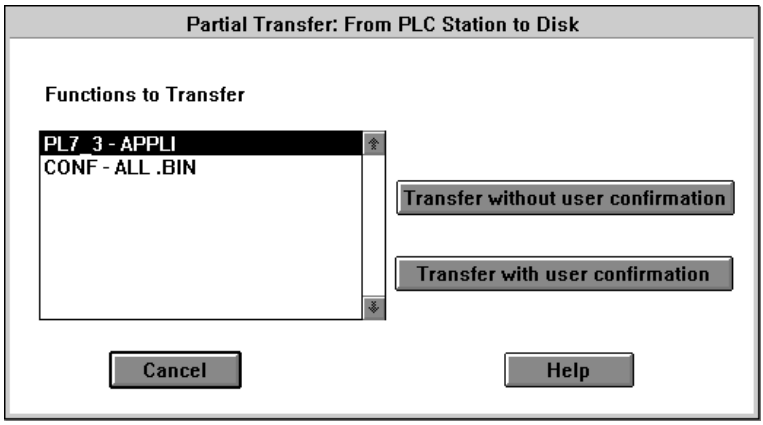
Connection with the PLC is established after confirmation of the action, for the duration of the transfer. The user can run another program while the transfer is taking place. A “Control Panel” is displayed to inform the user on progress of the transfer and of any errors that occur.



Cancel Lets the user cancel the action at any time.

5.5-2 PLC Station → Disk ⇒ Partial Transfer Action

This action lets the user select one or more application functions to download from the PLC station to the disk in the terminal.



The screen displays a list of functions available in the PLC station memory.
Select one or more lines from the list of functions:

- Using the mouse: click on the function to transfer. To select a number of functions hold down the <SHIFT> or <CTRL> keys while making the selection,
- From the keyboard: use the <TAB> key to move within the list, press <SPACEBAr> or <CTRL> <SPACEBAR> to confirm or cancel the selection of a function.

Transfer with confirm

Downloads the selected functions, any functions already present on the disk in the terminal are replaced with those in the PLC without the system warning the user.

Transfer without confirm

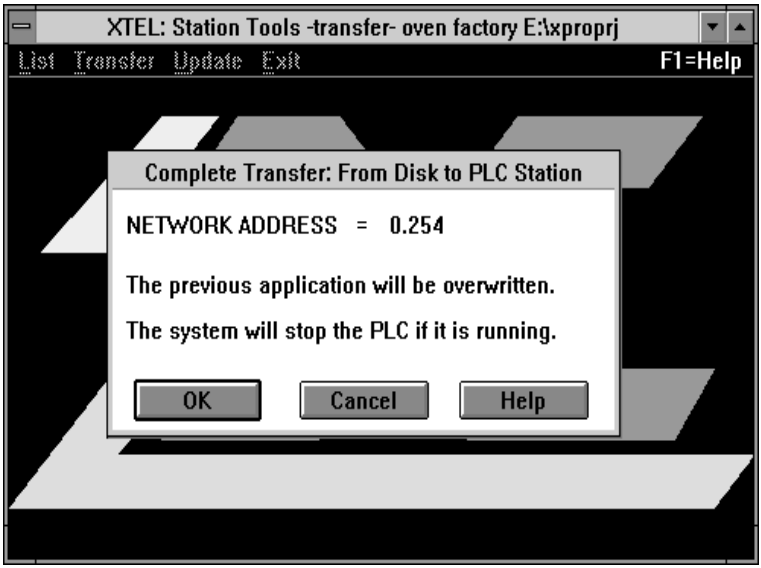
Downloads the selected functions, any functions already present on the disk in the terminal are replaced with those in the PLC after warning the user and requesting confirmation of the replacement.

Cancel Cancels the transfer request and returns the user to the XTEL-TRANSFER primary window.

D

5.5-3 Disk → PLC Station ⇒ Complete Transfer Action

This action uploads the entire application stored on disk into the PLC memory.

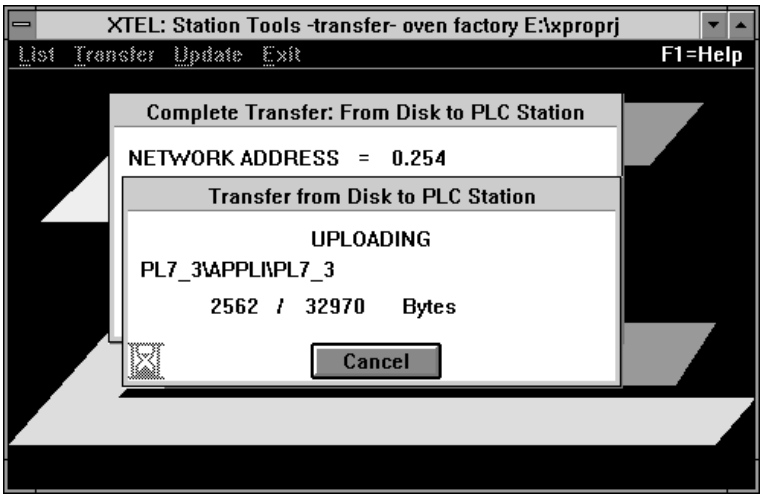


A confirm screen reminds the user of the direction of the transfer and the complete address (Network.Station) of the station with which communication is established.

OK Starts the transfer,

Cancel Cancels the transfer action and returns the user to the XTEL-TRANSFER primary window.

Connection with the PLC is established after confirmation of the action, for the duration of the transfer. The user can run another program while the transfer is taking place. A “Control Panel” is displayed informing the user on the progress of the transfer and of any errors that occur.

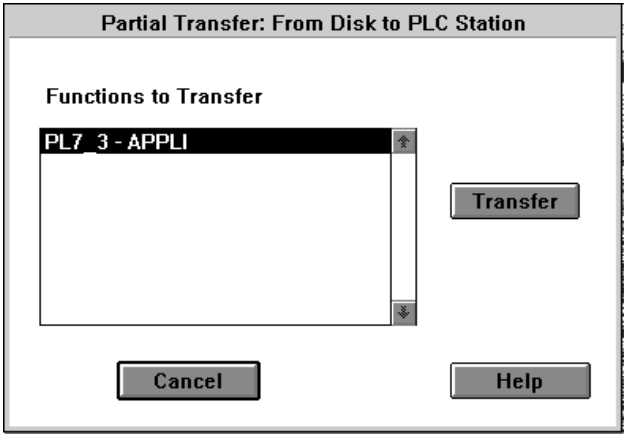


Cancel Lets the user cancel the action at any time.

Warning
If the transfer is cancelled, the application previously loaded in the PLC memory is lost.

5.5-4 Disk PLC Station -> Partial Transfer Action

This action lets the user select one or more application functions to upload from the disk in the terminal to the PLC station.



The screen displays a list of functions available on disk for the selected station.
Select one or more lines from the list of functions:

- Using the mouse: click on the function to transfer. To select a number of functions hold down the <SHIFT> or <CTRL> keys while making the selection,
- From the keyboard: use the <TAB> key to move within the list, press <SPACEBAR> or <CTRL> <SPACEBAR> to confirm or cancel the selection of a function.

Transfer Uploads the selected functions, any functions already present in the PLC station memory terminal are replaced with those on disk.

Cancel Cancels the transfer request and returns the user to the XTEL-TRANSFER primary window.

Warning
If the transfer is cancelled, the application previously loaded in the PLC memory is lost.

5.6 UPDATE Menu

5.6-1 Compare Action

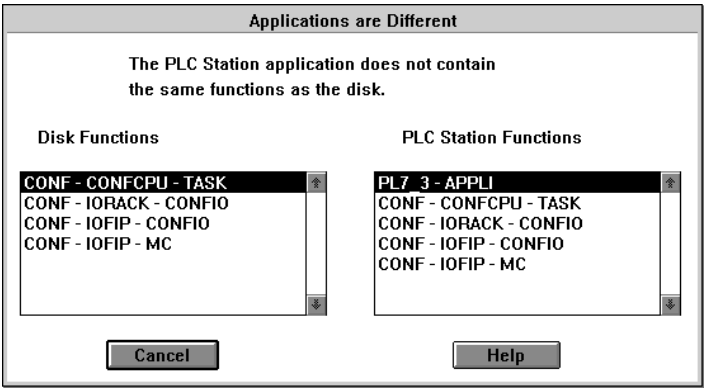
This action compares the application in the PLC station with the application stored on the hard disk in the terminal.
If the two applications are identical in structure (same functions declared) and only differ in the content of the functions, the user is prompted to update the file on-disk.

The comparison between the application in the PLC and the one stored on the hard disk is performed in two steps that are automatically linked:
- Station level comparison (application structure),
- Function level comparison.

The first step is systematically performed, while the second depends on the result of the first step.

Primary window level comparison:
This process checks that the configured functions and the size of the configured memory fields are identical. If so, the action level comparison can be performed, otherwise a message screen will list the differences found.

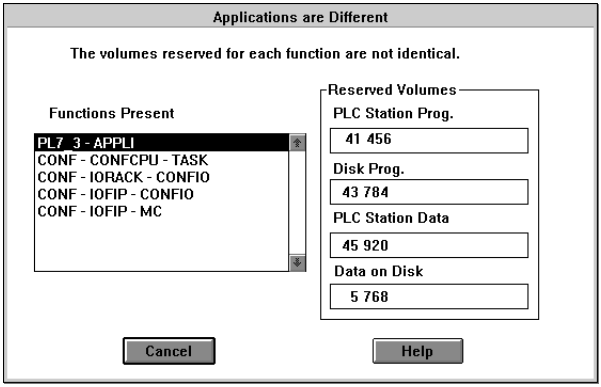
- The functions on-disk and in the PLC station are different



The application comprises two display fields that correspond to the functions mapped in the application stored on the hard disk and those loaded in the PLC.

Cancel Returns the user to the primary window.

- The memory fields reserved on-disk and in the PLC station are different



This screen displays the size of the various memory fields reserved in the PLC station and on-disk, for each function selected from the list on the left of the screen.

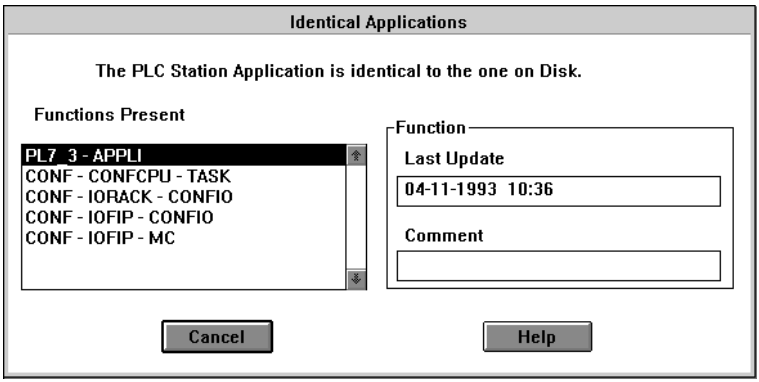
D

Function level comparison:

This comparison is only performed if the configuration and structure of both applications are identical. Each function has a header in the field that can be stored in ROM comprising information on the date of the last modification of the binary code of the function. This date is automatically stored each time that the binary code is modified. The date is shows the development level of the function program.

There are two possible cases:

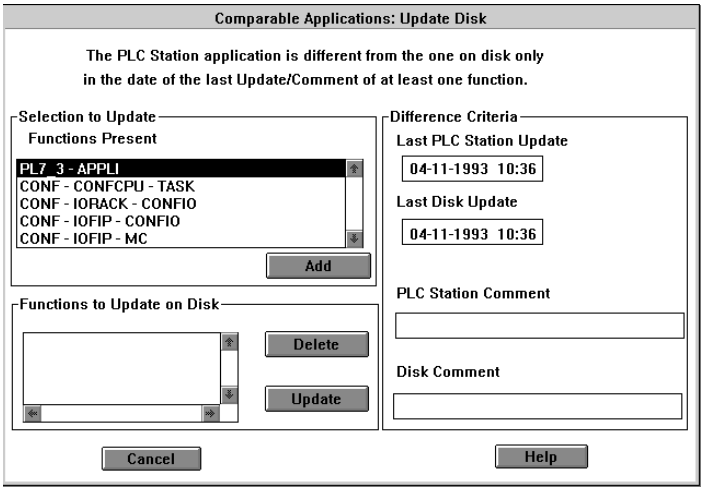
- The dates are identical for each function



This screen lists all of the functions present and for each selected function, displays the date of the last modification and any comment that may have been entered when the function was programmed.

Cancel Returns the user to the primary window.

- At least one of the functions in the PLC memory and on the hard disk has a different date (identical structure for each function but different binary file contents). A screen is displayed to prompt the user to update the application on the hard disk from the application in the PLC station.



Individually select each function listed in the "Functions Present" list and check that the date of the last update shown for the PLC station and the hard disk file are identical, as shown in the "Difference Criteria" list.
Then update the functions with different dates, using the buttons listed below:

Add Adds the function selected in the "Functions Present" field to the "Functions to Update on Disk" field (it is highlighted in reverse video).

Update Transfers the files to update as selected in the "Functions to Update on Disk" field.

Delete Deletes the selected function (in reverse video) from the "Functions to Update on Disk" field

Cancel Lets the user exit the screen and return to the primary window.

5.7 Error Messages

A description of error messages is also available from the on-line Help file, List Transfer messages action in the Reference menu. A window displays all of the messages. Clicking on the selected message and a dialog box will display the appropriate information.

Cartridge size incompatible with the PLC processor

Probable cause	Corrective action
The system informs the user that the memory cartridge installed in the PLC is not an acceptable type.	Insert a compatible memory cartridge.

Communication error with the PLC

Probable cause	Corrective action
The PLC is not responding as expected by the system to requests.	Check that all connections are correct. Check that the PLC is operating correctly. Where a network connection is used, check that network continuity is ensured.

Error accessing a file on-disk!

Probable cause	Corrective action
An attempt made by the system, to read or write a disk file on the workstation failed. System	Ensure that no other program is currently accessing the same application on the workstation. Ensure that the Operating on the workstation is correct).

Error opening file

Probable cause	Corrective action
An attempt by the system to open a disk file on the workstation failed.	Check that another program is not accessing the same application on the workstation. Check that the Operating System is OK.

Error reading from PLC

Probable cause	Corrective action
An attempt to read from the PLC station by the system failed.	Check that all connections are correct. Check that the PLC is operating correctly. Where a network connection is used, check that network continuity is ensured.

Error writing to PLC

Probable cause	Corrective action
An attempt to write to the PLC station by the system failed.	Check that all connections are correct. Check that the PLC is operating correctly. Where a network connection is used, check that network continuity is ensured.

Function <its name> is not present on-disk!

Probable cause	Corrective action
XTEL-TRANSFER will only download to the workstation, PLC applications whose functions have all previously been created in the X-TEL station that is running the tool.	Create the function designated by the message in the currently selected station (using the Define/New... action).

Inadequate access rights

Probable cause	Corrective action
Inadequate access rights for performing the selected action.	Change the access rights. Program Max. or higher access rights are needed. Adjust Min. will allow partial or complete uploading. Adjust Min. is inadequate.

Inadequate disk space

Cause probable	Action corrective
The workstation disk is full.	Clear enough space on it.

Incoherent Application! The <its name> function must be linked to the XTEL-CONF configuration

Probable cause	Corrective action
XTEL-TRANSFER does not allow loading a PLC with an application in which, for example, the PL7-3 function is not assigned to the configuration declared with XTEL-CONF.	Assign the PL7 application (using the [Conf_V5] command in PL7-3) to the configuration declared in XTEL-CONF.

Incompatible PLC processor or memory too small for the application

Probable cause	Corrective action
An attempt to write to the PLC station by the system failed: The target PLC processor type is not compatible with the type of PLC processor that the application was designed for (as declared in XTEL-CONF) or the amount of memory taken by the selected application cannot be provided by the target PLC.	Check the PLC types: The one selected for use with XTEL-CONTROL and the one declared in the application using XTEL-CONF. Check the PLC memory cartridge.

Incompatible PLC processor or memory too small for the <its name> function

Probable cause	Corrective action
An attempt to write to the PLC station by the system failed: The target PLC processor type is not compatible with the type of PLC processor that the application was designed for (as declared in XTEL-CONF) or the amount of memory taken by the selected function cannot be provided by the target PLC.	Check the PLC types: The one selected for use with XTEL-CONTROL and the one declared in the application using XTEL-CONF. Check the memory filed assigned to the selected function is no larger than the field reserved for it in the PLC station (using XTEL-CONF/Generate and Transfer/ Update... or Transfer/List of Station Functions...). Check the PLC memory cartridge.

Initialization error on PLC link

Probable cause	Corrective action
An attempt to initalize communication between the system and the PLC station failed.	Check that the correct driver is selected in X-TEL (using the Driver... menu). Check the station address in X-TEL. Check that all connections are correct. Check that the PLC is operating correctly. Where a network is used, check that network continuity is ensured.

No function is present on-disk

Probable cause	Corrective action
No application was created, for any function, in the currently selected Software Workshop station.	Create the functions in the Software Workshop station and assign applications (using the Define/New... menus).

No functions selected, no transfer performed

Probable cause	Corrective action
No function selected during an update.	Select the function to transfer.

No valid application in the PLC station

Probable cause	Corrective action
It is impossible to download an application from a PLC if it is incoherent.	Theoretically, this case should not occur! Check that a prior upload to the PLC station was not interrupted prior to completion. This may leave an invalid application loaded in the PLC.

PLC already reserved

Probable cause	Corrective action
The PLC is already reserved by another application.	Close or quit the application that reserved the PLC.

PLC station status incompatible with loading

Probable cause	Corrective action
The status of the PLC will not allow it to accept uploading of a new application to its memory.	Check the status of the PLC to load.

PLC version level prior to V5

Probable cause	Corrective action
XTEL-TRANSFER, run from a V5 level X-TEL station cannot handle PLC versions prior to V5.	

PROM PLC cartridge

Probable cause	Corrective action
A PROM type PLC cartridge cannot be loaded by XTEL-TRANSFER: Use XTEL-PROMPROG.	Replace the PROM cartridge with a RAM cartridge or use X-TEL-PROMPROG.

Protected application

Probable cause	Corrective action
The application cannot be read at all: It was protected by its designer.	A protected application cannot be read.

SYS: Incorrect application format

Probable cause	Corrective action
System Error: The format of the application stored on the workstation disk is not the same as the system requires.	This message should not occur! Delete the application that caused it: It cannot be used and no corrective action is possible.

SYS: Not enough memory space

Probable cause	Corrective action
System Error: The system cannot find enough RAM free for it to run correctly.	Close other programs that take memory away from X-TEL or MINI X-TEL. Ensure that the Operating System is OK.

SYS: The format of binary file <its name> is incorrect

Probable cause	Corrective action
System Error: The format of the application stored on disk in the workstation, for the designated function, does not match the format required by the system.	This message is for information only. If it is displayed, delete the application that causes it: It cannot be used and no corrective action is possible.

The application does not exist on-disk

Probable cause	Corrective action
The system cannot find a file on the workstation disk. It cannot perform the requested task.	Check that XTEL-TRANSFER is running on the correct X-TEL station. Check that all functions do have an application stored on disk.

The designated PLC station does not answer or does not exist

Probable cause	Corrective action
An attempt to communicate between workstation and a PLC station failed.	Check that the correct driver is selected in X-TEL (using the Driver... menu). Check that the PLC is operating correctly. Where a network connection is used, check that network continuity is ensured.

The <its name> function is invalid!

Probable cause	Corrective action
The system cannot process the application of the designated function normally in the PLC station.	Check the status of the PLC and its memory cartridge. Use the appropriate programming tool for this function in on-line mode to complete troubleshooting.

The <its name> function is not present in the PLC station!

Probable cause	Corrective action
The function that should be processed by the PLC and the workstation does not exist in the PLC station.	Check that the correct PLC is on-line.

D

The PLC application cannot be read

Probable cause	Corrective action
An attempt to read from the PLC station by the system failed for an unknown reason.	Check the condition of the PLC memory cartridge. Check that the PLC is configured (MEM LED). Check that the PLC is operating correctly.

Transfer Impossible! The <its name> function is not valid on-disk!

Probable cause	Corrective action
The application for the designated function is not stored on-disk in the workstation (and in the currently selected station).	Remember that the presence of a function can be declared in XTEL-CONF without its application ever being saved to disk. Check that the tool is running from the correct X-TEL station.

Transfer Impossible! The <its name> function is not valid on the PLC station

Probable cause	Corrective action
The application for the designated function is not loaded or is incorrect in the PLC station.	Remember that a function can be declared present using XTEL-CONF without its application ever being saved to disk.

The PLC processor code for the <its name> function is unknown

Probable cause	Corrective action
The application for the designated function is not designed for a PLC type recognized by XTEL-TRANSFER.	Bring the designated application to V5 level.

Transfer stopped before completion

Probable cause	Corrective action
The message is displayed by the system when a transfer is interrupted at the operator's request. Obviously the application that was incompletely transferred is potentially incoherent.	Return the application to a stable condition as soon as possible.

Unknown PLC processor code

Probable cause	Corrective action
The PLC processor connected is not a type recognized by XTEL-TRANSFER.	

6.1 Presentation

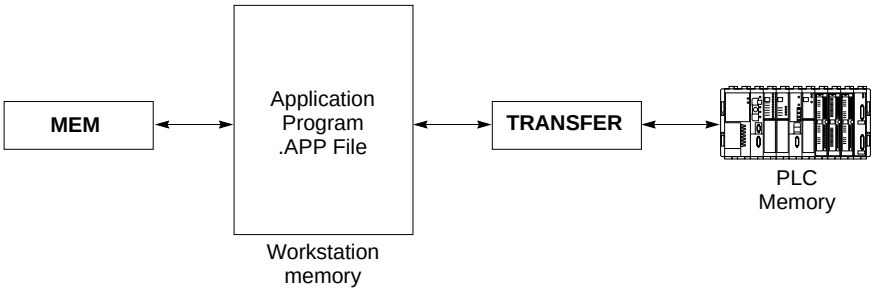
Used only with TSX Series 7 V4 level stations, the XTEL-TRANSFER tool is a station level operating program that operates on-line only with TSX Series 7 Model 40 V4 level PLCs. It handles transfer and selective updating of the Station program (i.e. the .APP file generated by the XTEL-MEM program).

To run, the program requires a programming port or MAPWAY driver. The transfer request will be refused if the user's access rights are inadequate. Access rights of at least Adjust min. are required.

6.2 Functions

- **Station program transfer presentation**
  Two-way transfer is effective on the entire station program, the .APP file can be transferred from Disk to PLC memory or from PLC memory to Disk.

  Block diagram



  During the transfer, the program reserves the entire capacity of the PLC.
  Transfer does not however require the full processing capacity of the workstation and it can be performed in the background so that other tasks or programs can continue to be executed in the foreground.

- **Transfer from Disk to PLC Memory**
  This transfer stops execution of the PLC program. Any program in the PLC memory is overwritten by the program transferred from Disk.
  The .APP file on the disk is transferred to the PLC memory.

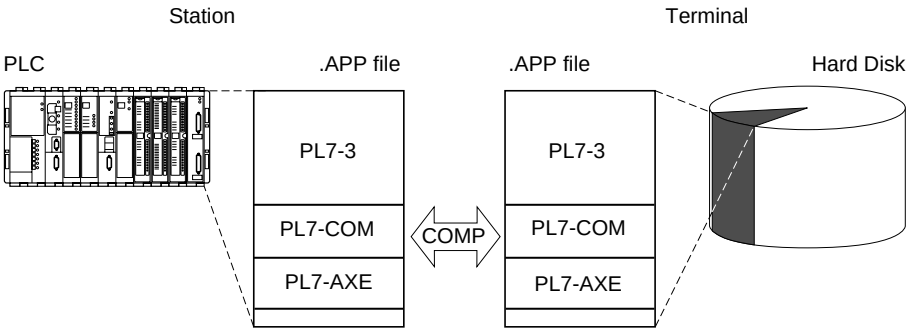
- **Transfer from PLC Memory to Disk**
  The entire application program transferred to the disk located in the workstation can then be accessed by XTEL-MEM.
  If the transfer is interrupted before it is complete, the original context is retained.
  The .APP file in the PLC memory is transferred to the .APP directory of the station.

  Note:
  To access the contents of the binary source files or each specialized function, the source files must first be transferred via the Transfer action supported by each function.

- **Comparing application programs**
  This action can be performed in two stages if required:
  - Comparison of the .APP file on disk with that in the PLC,
  - Partial update of the application if a difference is found between the two file.

  The comparison is performed on the station application, therefore on .APP files.

Diagram



Comparison execution

- Complete comparison: Station Descriptor
  This is the first phase of the comparison. The program checks that the configured fields are identical and that they have the same assigned sizes.
  For example in the diagram shown above, there are three identical fields.
- Function level comparison: Function Descriptor
  This second phase of the comparison is only performed if the memory maps are identical.
  Each field has a function descriptor that includes the date of the last modification of the field's binary data.

The date is automatically stored each time a change is made to the binary source program. The date is taken from the real-time clock in the PLC when on-line or from the workstation's clock when local mode operation is selected.

The date serves as an indication of the program development level.

Partial update
Partial update of the application on the diskette is done after a comparison of the program.
It can be performed if the configured fields and their assigned sizes are identical. Any difference must be at a functional level.
The user is free to decide on whether or not to update the corresponding functions.
The files transferred update the corresponding functions in the .APP file

List of configured functions
This command displays the specialized functions supported by the application without transferring the .APP source file.

For each function, the program displays the following data:

- Date of the last modification made,
- Application comments.

Points to Remember about XTEL-Transfer:
- Two-way transfer of the application .APP file,
- Application .APP file comparison,
- Identification of differences and partial file update,
- Lists configured functions.

6.3 Accessing the XTEL-TRANSFER Tool

The user can access the XTEL-Transfer Tool:

- In the X-TEL Software Workshop: from the station tools available for managing a TSX V4 or PMX V4 station in the X-TEL Software Workshop,
- In the MINI X-TEL Software Workshop: from the primary window.

X-TEL

- Select a Volume
  - Select a Project
    - Select a Station
      - Select the XTEL-TRANSFER Tool in Station Tools

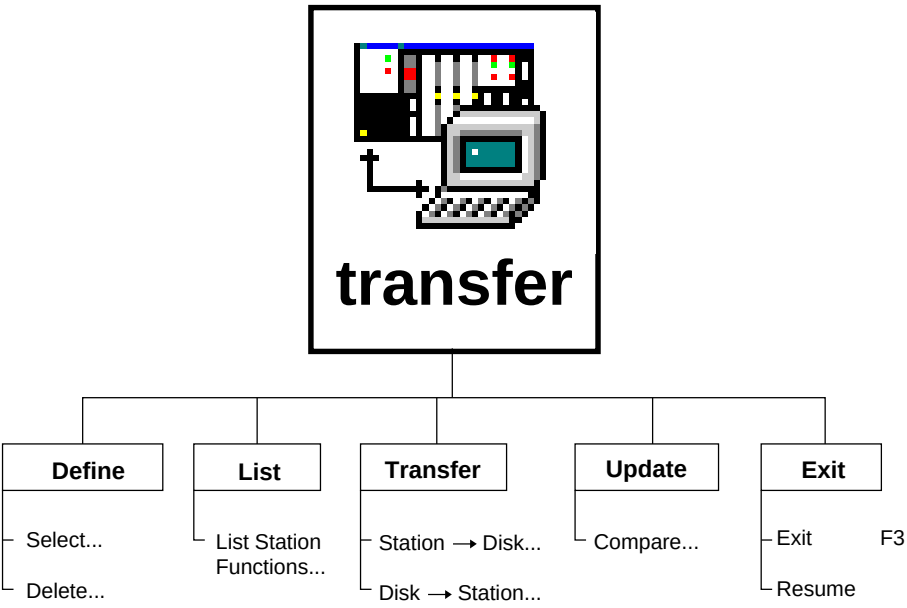
MINI X-TEL

- Primary window
  - Select XTEL-TRANSFER in the primary window

Primary window

The primary window of the XTEL-TRANSFER tool lets the user select an action to perform from one of the five menus available via the action bar.

Diagram


transfer
Define
Select...
Delete...
List
List Station Functions...
Transfer
Station → Disk...
Disk → Station...
Update
Compare...
Exit
Exit F3
Resume

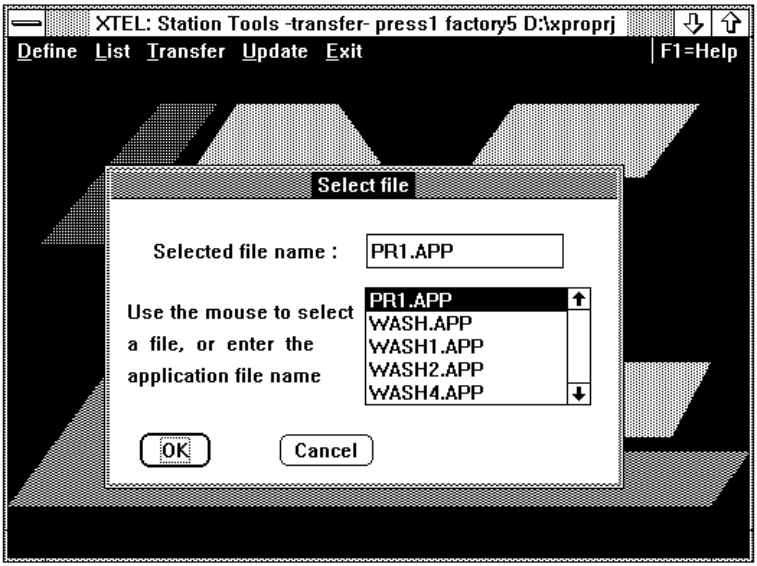
D

6.4 DEFINE Menu

6.4-1 Select Action

Before the user can perform a transfer or an update, an application file must be selected through the Select Menu. If an application file is not selected first or if a new file name is entered directly, some of the actions listed in the menus cannot be accessed and are shown dimmed.

The selection screen displays a list of all of the applications created on this station (.APP files). The application name can be selected from the list or entered directly in the appropriate field. When it is selected from the list (shown in reverse video), its name is automatically displayed in the data entry field.



The name that is selected by default is the first in the list (if the list is not empty). The user can enter a name that does not exist in the list, for example when storing a PLC application on the hard disk (Station ¿ Disk action). In this case the Disk ¿ Station action Compare and Transfer options are dimmed and cannot be selected. Only the Station ¿ Disk action Transfer option can be accessed.

Until a file is selected, the Transfer and Compare actions cannot be accessed.

OK Validates the entry. If the syntax is incorrect, the “Incorrect Name. Syntax xxxxxxxxx.APP” message is displayed,

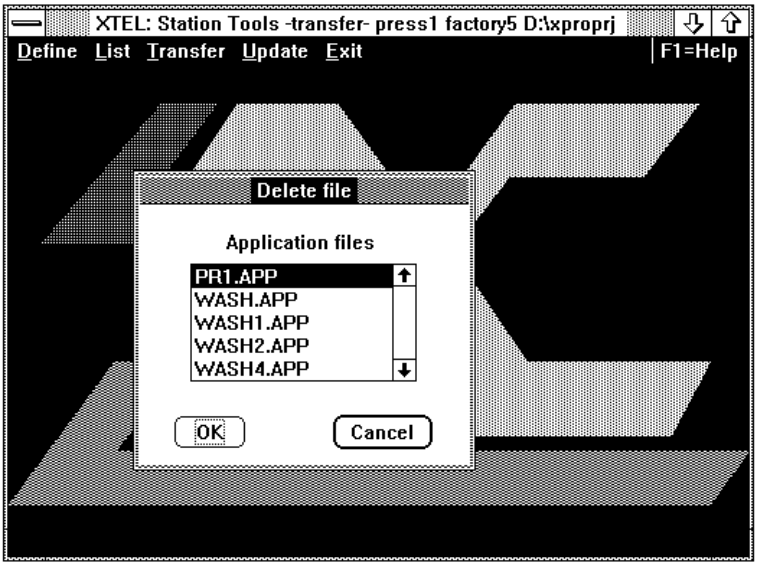
Cancel Cancels the entry and any changes made.

6.4-2 Delete Action

This action lets the user delete an .APP file. A dialog box displays a list of the applications created on this station. The selected application is displayed in reverse video.

OK The user is requested to confirm the action before the file is deleted. If no file is selected, the “No filename selected” message is displayed,

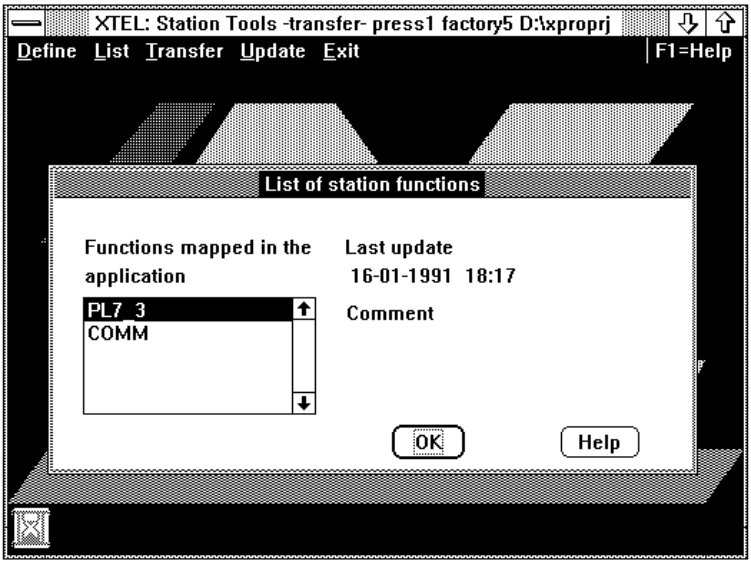
Cancel Cancels the request to delete the selected .APP file and returns the user to the XTEL-TRANSFER primary window.



6.5 LIST Menu

6.5-1 List of Station Functions Action

The list option lets the user display the functions configured for a station. No transfer is performed, only a listing of the PLC configuration at function level.



A complete list of mapped functions is displayed. The “Last update” and “Comments” fields relate to the selected function.

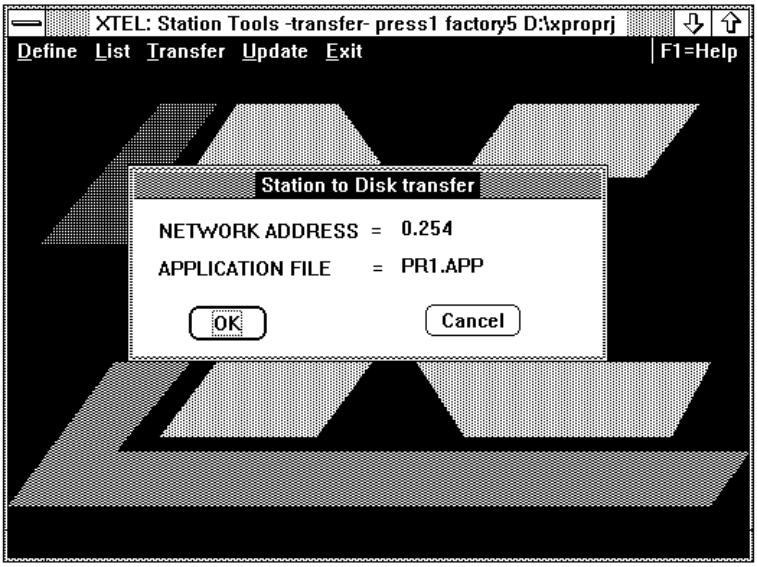
This information is read from the PLC memory. No files are affected, therefore no .APP files need to be selected to run this option. This is the reason that the List action is not dimmed when the XTEL-TRANSFER tool is selected.

OK Returns the user to the XTEL-TRANSFER tool primary window.

6.6 Transfer Menu

6.6-1 TSX → Disk Action

This action lets the user backup the contents of the PLC memory to an application file (xxxxxxxx.APP filename).



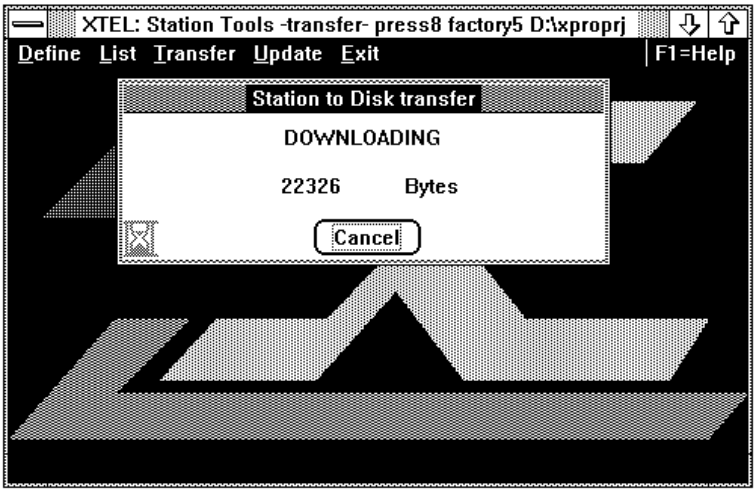
A confirmation screen reminds the user of the direction of the selected transfer, the name of the application file and the complete (Network.Station) address of the station with which communication is established.

OK Starts the transfer,

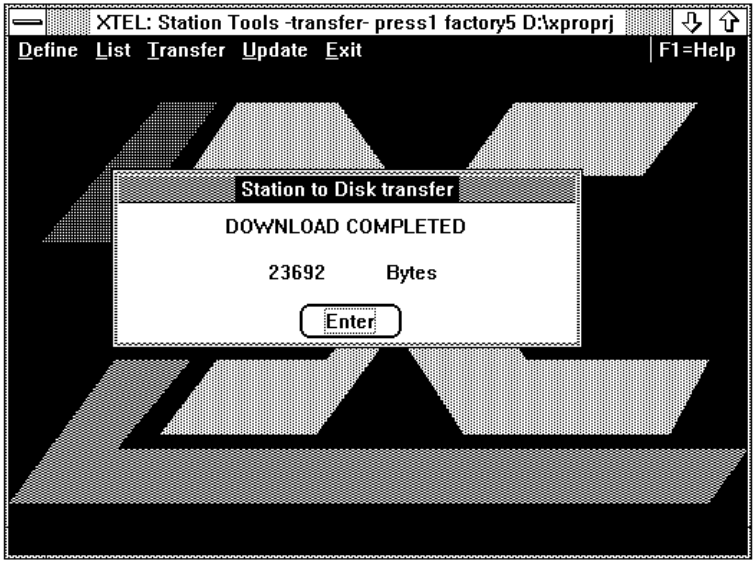
Cancel Cancels the request to delete the selected .APP file and returns the user to the XTEL-TRANSFER primary window.

D

Connection with the PLC is established after confirmation of the action, for the duration of the transfer. The user can run another program while the transfer is taking place. A “Control Panel” display that appears informs the user on the progress of the transfer and of any errors that occur.

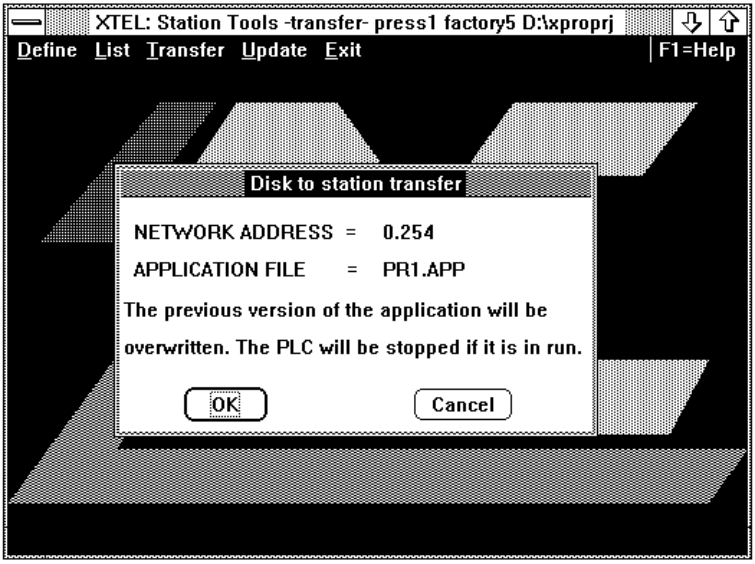


Cancel Lets the user cancel the operation at any time.



6.6-2 Disk → TSX Action

This action loads the contents of the application file (xxxxxxxx.APP) into the PLC memory.

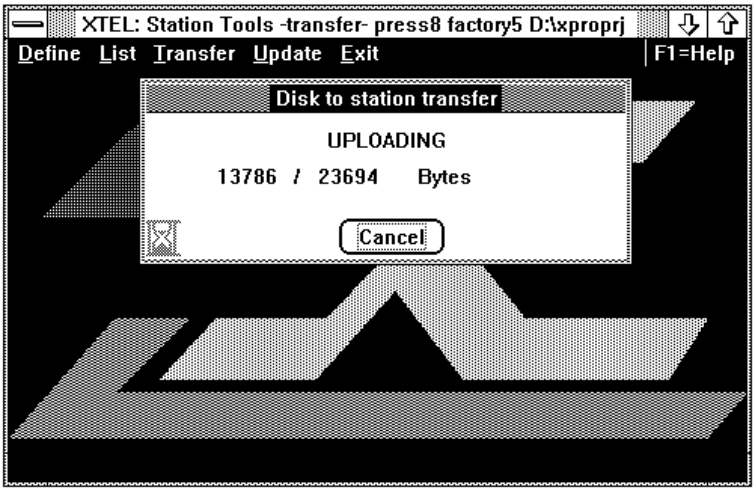


A confirm screen reminds the user of the direction of the transfer, the name of the application file and the complete address (Network.Station) of the station with which communication is established.

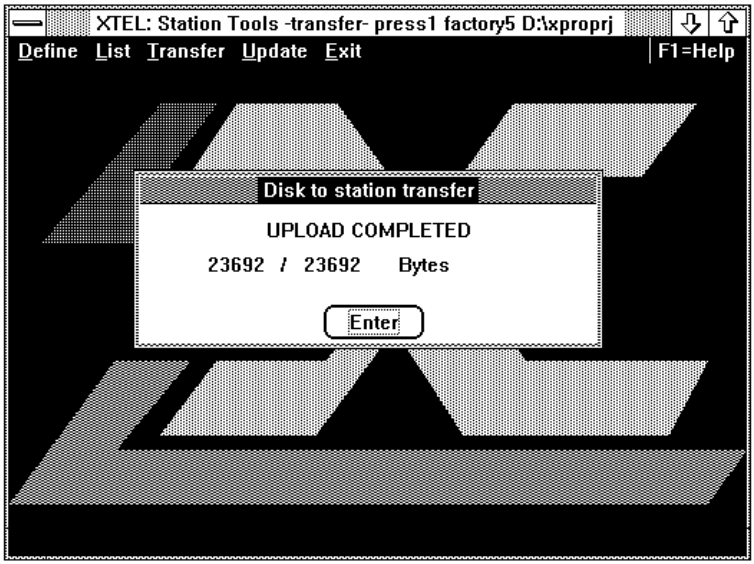
OK Starts the transfer,

Cancel Cancels the transfer action and returns the user to the XTEL-TRANSFER primary window.

Connection with the PLC is established after confirmation of the action, for the duration of the transfer. The user can run another program while the transfer is taking place. A “Control Panel” display that appears informs the user on the progress of the transfer and of any errors that occur.



Cancel Lets the user cancel the action at any time.



6.7 UPDATE Menu

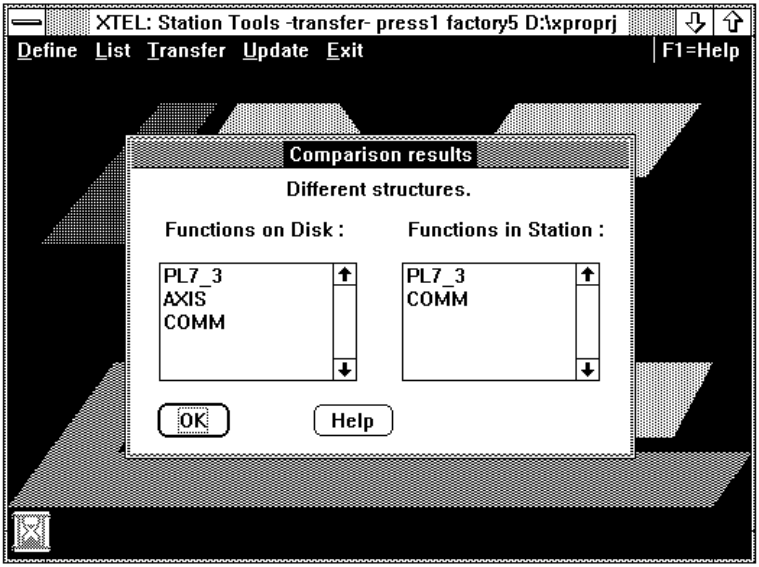
6.7-1 Compare Action

The comparison between the application in the PLC and the application stored on the hard disk (xxxxxxxx.APP file) is performed in two stages that are automatically linked:

- Station level comparison (memory map),
- Function level comparison.

The first step is systematically performed, while the second depends on the result of the first step.

Primary window level comparison:
This process checks that the configured functions the size of the configured memory fields are identical. If so, the action level comparison can be performed, otherwise a message screen will list the differences found.



The application comprises two display fields that correspond to the functions mapped in the application stored on the hard disk and that loaded in the PLC.

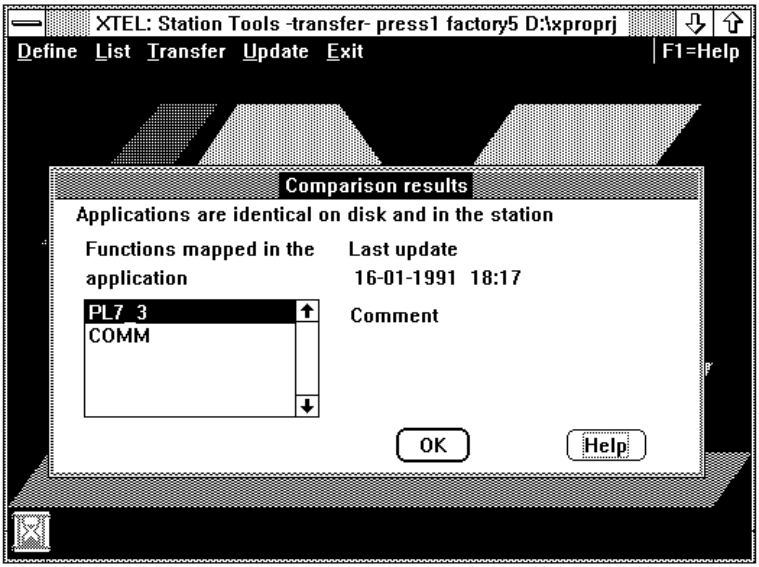
OK Returns the user to the primary window.

Function level comparison:

This comparison is only performed if the memory maps are identical. Each action has a header in the field that can be stored in ROM comprising information on the date of the last modification of the binary code of the action. This date is automatically stored each time that the binary code is modified. The date is shows the development level of the action program.

There are two possible cases:

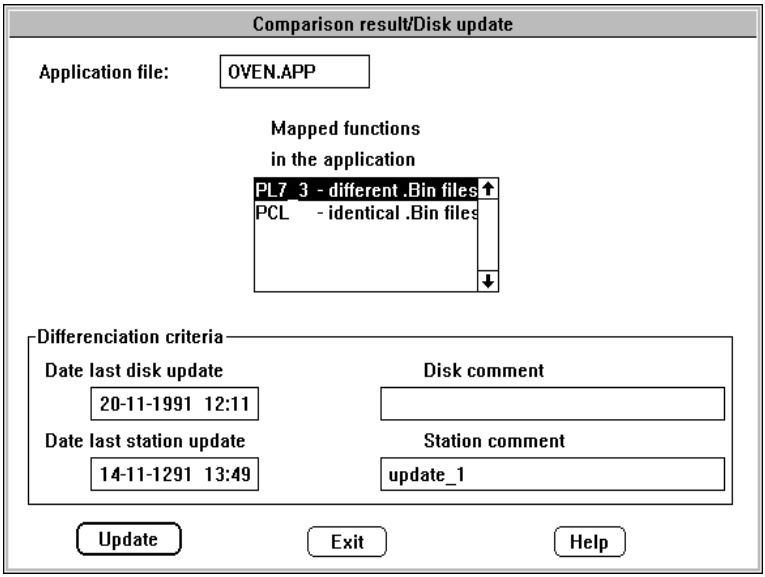
- The dates of all of the mapped functions are the same (memory mapping and binary code is identical for each action).



This screen displays all of the functions that are mapped and for each selected action, gives the date of the last modification and displays any comment that may have been entered when the action was programmed.

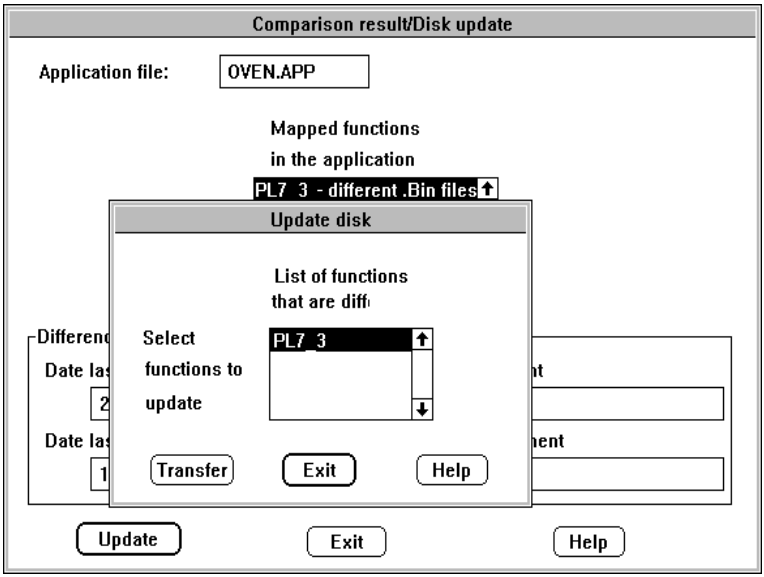
OK Returns the user to the primary window

- At least one of the functions mapped in the PLC memory and on the hard disk has a different date (identical mapping but different binary files). A screen is displayed to prompt the user to update the application on the hard disk from the application in the PLC (xxxxxxxx.APP file).



Update Displays a dialog box for the user to select the files to update (refer to the description on the next page),

Exit Lets the user exit the Disk update screen and return to the primary window.



Transfer Transfers the selected files,

Exit Lets the user exit the Disk update screen and return to the previous window.

6.8 Error Messages

Application protected

Probable cause	Corrective action
Attempted transfer of a read protected application from PLC to disk.	A protected application cannot be read.

Cannot read station application

Probable cause	Corrective action
The PLC application cannot be read (no program or blank cartridge).	Load the program or insert a loaded cartridge.

Communication error with PLC

Probable cause	Corrective action
The PLC will not allow the transfer.	Check the PLC (processor failure, etc.).

File does not exist

Probable cause	Corrective action
Request to transfer a file that does not exist.	Select a file that exists.

Inadequate access rights

Probable cause	Corrective action
Inadequate access rights for performing the selected action.	Change the access rights.

Incorrect name. Correct syntax is xxxxxxxx.APP

Probable cause	Corrective action
Syntax error when entering a file name.	Enter the correct file name with 8 characters and the .APP extension.

No function selected, no transfer performed

Probable cause	Corrective action
No function selected during an update.	Select the function to transfer.

No valid application on station

Probable cause	Corrective action
Attempted transfer from PLC to hard disk when no application is loaded in memory.	Load a program into the PLC memory.

Open file error

Probable cause	Corrective action
File reserved by another application.	Close or quit the application that reserved the file.

PLC already reserved

Probable cause	Corrective action
The PLC is already reserved by another application.	Close or quit the application that reserved the PLC.

PLC cartridge is PROM

Probable cause	Corrective action
Attempt to write to a Prom cartridge.	Replace the Prom cartridge with a Ram cartridge.

PLC data link initialization error

Probable cause	Corrective action
PLC initialization unsuccessful.	Check the connection between the workstation and the PLC.

PLC read aborted, update canceled

Probable cause	Corrective action
Data errors occurred during transfer.	Repeat the transfer.

PLC read error

Probable cause	Corrective action
Data link error during transfer from PLC to hard disk.	Repeat the transfer.

PLC write error

Probable cause	Corrective action
Data link error during transfer from hard disk to PLC.	Repeat the transfer.

The .APP file is inconsistent with the PLC memory mapping

Probable cause	Corrective action
Attempted transfer to the PLC of an incompatible application.	Change processor type.
Loading an application in a PLC that does not have enough memory available.	Change the memory mapping or increase the amount of memory available.

D

The file is not in .APP file format

Probable cause	Corrective action
The input file is an .APP file but its data cannot be used (damaged file or incompatible file with an .APP extension).	Select or create another .APP file.

The given station does not respond or does not exist

Probable cause	Corrective action
No communication is possible with the selected station.	Check the station or its network address.

The work file chosen by the ‘selection’ menu cannot be deleted

Probable cause	Corrective action
A previously selected file was chosen for deletion.	Select a file for deletion that has not already been chosen.

State of station incompatible with upload

Probable cause	Corrective action
Attempted transfer to a running PLC.	Stop the PLC.

You cannot delete this file

Probable cause	Corrective action
The file has already been opened by another application.	Close or quit the application that requires access to the file.

7.1 Functions

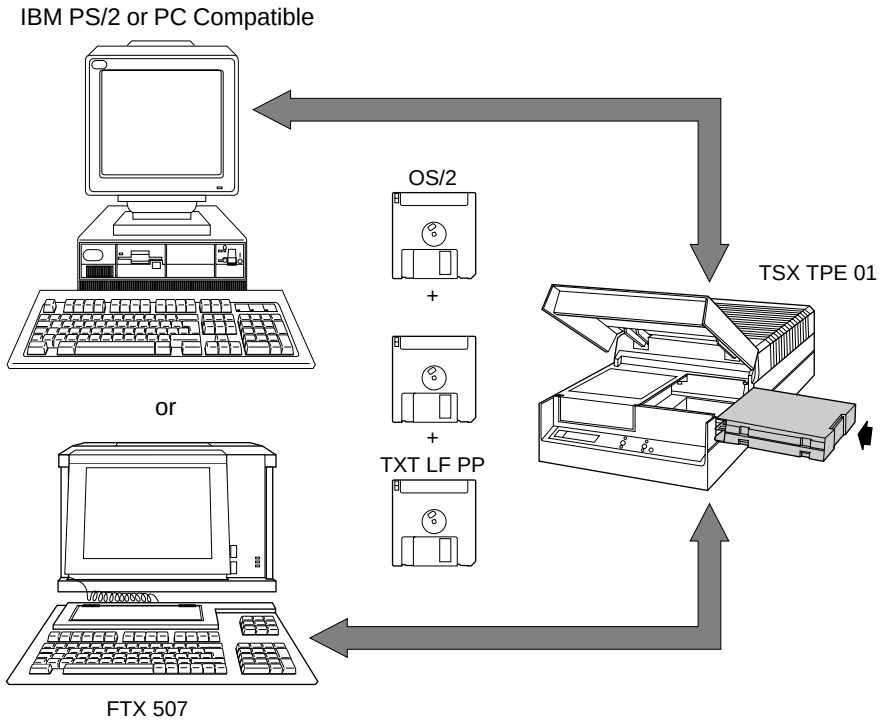
7.1-1 General

The PROMPROG TXT LF PP software supports the following operations:

- **Writing** or **reading** of RAM or EPROM user cartridges.
- **Reading** of EEPROM user cartridges.
  Note: It is impossible to write EEPROM cartridges.
- **Writing and protecting**(1) EPROM user cartridges.
- **Identification** of cartridges present in the programmer and testing that they are blank.
- **Comparing** cartridge contents with the contents of the corresponding station directory file.
- **Calculating the checksum** for the cartridge.

Writing to the cartridge transfers a user application **stored in a file** in the terminal via a serial link to the cartridge in the TSX TPE 01 cartridge programmer.

For all of these operations to be performed, the FTX 507 or FTX 417 terminal, IBM PS/2 or PC compatible microcomputer must have the X-TEL Software Workshop installed and be connected to the TSX TPE 01 cartridge programmer.



(1) Only for TSX 17/27/47, TSXV4/V5, PMXV4/V5 applications.

7.1-2 Function Compatibility with Applications and Cartridge Types

Applications	Cartridge Programmer Functions

		Write			Read		
		RAM	EPROM	EEPROM	RAM	EPROM	EEPROM
TSX 17 (PL7-2)							
TSX 27/47 (PL7-2)							
TSXV3 (PL7-3)	**sing. cart.**						
	multi. cart.						
TSXV4, PMXV4 **TSXV5, PMXV5** (PL7-3)							
PL7-MMI							

		Compare			Write and Protect		
		RAM	EPROM	EEPROM	RAM	EPROM	EEPROM
TSX 17 (PL7-2)							
TSX 27/47 (PL7-2)							
TSXV3 (PL7-3)	**sing. cart.**						
	multi. cart.						
TSXV4, PMXV4 **TSXV5, PMXV5** (PL7-3)							
PL7-MMI							

		Checksum Calculation		
		RAM	EPROM	EEPROM
TSX 17 (PL7-2)				
TSX 27/47 (PL7-2)				
TSXV3 (PL7-3)	**sing. cart.**			
	multi. cart.			
TSXV4, PMXV4 (PL7-3) **TSXV5, PMXV5**				
PL7-MMI				

Compatible functions

7.1-3 Cartridges Supported

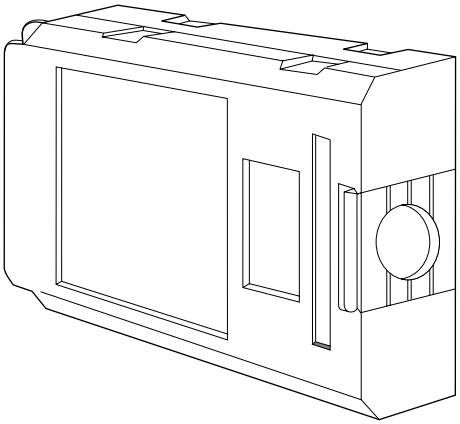
The cartridge programmer is designed for reading and writing applications generated in the X-TEL or MINI X-TEL Software Workshops and intended for use with:

- TSX Series 7 PLCs (8-bit cartridges for TSX 17-20, 8-bit cartridges for TSX 27/47-10/47-J/47-20, 16-bit cartridges for TSX/PMX 47/67/87/107).
- TSX PCM 27/37 modules (16-bit cartidges).

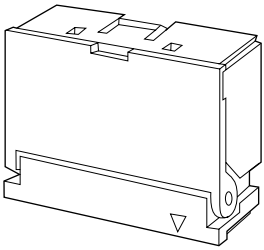
Due to the different connections used, the TSX TPE 01 cartridge programmer has two slots:

- One for TSX 27/47/67/87/107, PMX 47/67/87/107 or TSX PCM 27/37 cartridges,
- One for TSX 17 cartridges.

TSX27/47/67/87/107 Cartridges
PMX 47/67/87/107
TSX PCM 27/37



TSX 17 Cartridges



7.2 Accessing the PROMPROG Program

7.2-1 General

The PROMPROG tool is accessed:

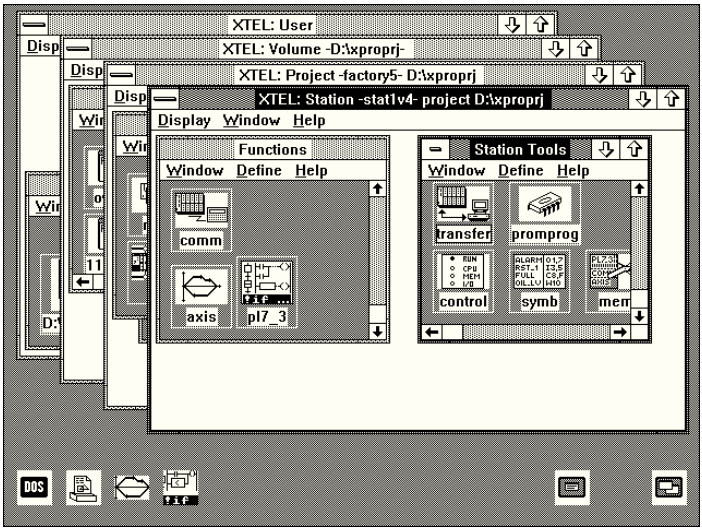
- In the X-TEL Software Workshop from the Station Tools available,
- In the MINI X-TEL Software Workshop from the primary window.

X-TEL

- Select a Volume
  - Select a Project
    - Select a Station
      - Select PROMPROG from Station Tools

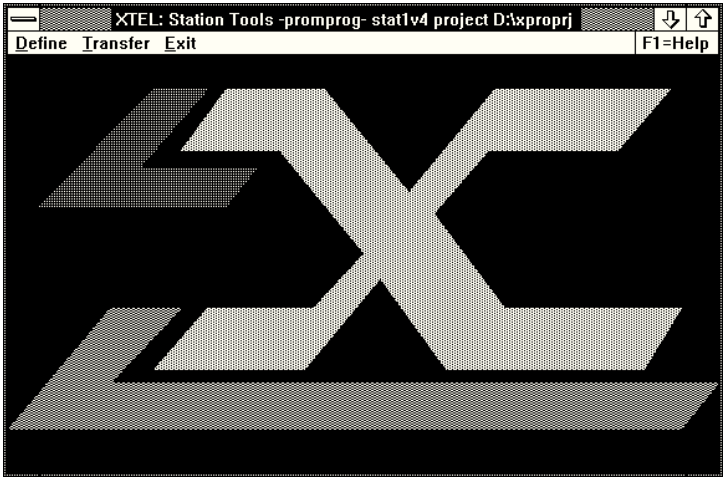
MINI X-TEL

- Primary Window
  - Select PROMPROG from the primary window

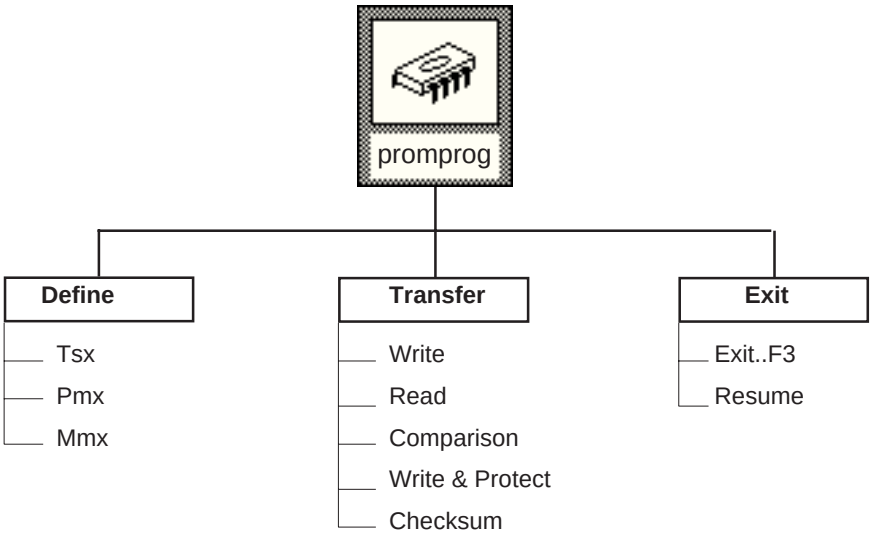


7.2-2 Primary Window

The required function is selected from one of the three menus in the PROMPROG primary window.



Diagram



Note:
Sub-menus that are incompatible with the selected type of station or type of application are dimmed and cannot be accessed.

7.3 Define Menu

Define lets the user select the type of application to transfer to the cartridge.

- **Tsx:**
  - TSX 17/27/47 (PL7-2) application for TSX 17/27/47 PLCs,
  - TSXV3 (PL7-3) application for TSX 47-30, TSX 67-20/30, TSX 87-10/20/30 PLCs,
  - TSXV4/V5 (PL7-3) application for TSX 47-40, 67-40, 87-40, 107-40 PLCs.
- **Pmx:**
  - PMXV4/V5 (PL7-3) application for PMX 47-40, 67-40, 87-40, 107-40 PLCs.
- **Mmx:**
  - PL7-MMI V4 and V5 application for TSX PCM 27/37 modules.

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7.3-1 TSX 17/27/47, TSXV3, TSXV4, PMXV4, PL7-MMIV4 Applications

Mmx menu

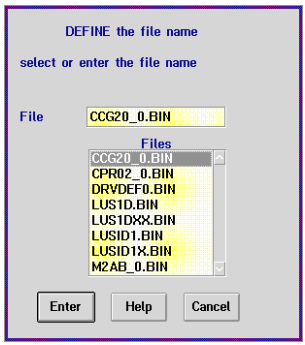
This menu lets the user select the source of the data to transfer. This IMDSK-DAT file located in the XPROSYS\MMI directory is the image of a DOS disk configured for the requirements of the interface module.

Tsx or Pmx menu

This menu displays the "DEFINE the file name" dialog box that lets the user:

- Select a file:
  - • BIN files for TSX 17/27/47 or TSXV3 applications,
  - • .APP files for TSXV4 or PMXV4 applications.

  This file is selected from those available in the station directory,
- Enter a new file name (for .BIN or .APP files) ready for reading a cartridge.



Select the file name required using the <Ø> <≠> keys or use the mouse to click on the file name. The selected file name is shown in the upper window.

To read, enter a new file name to avoid overwriting the contents of the existing file in the Station directory. This is achieved by deleting the name of the existing file in the upper window and then typing in the new name.

Enter	Selects the file and returns the user to the primary window,
Cancel	Cancels the action and returns the user to the primary window,
Help	Lets the user access an on-line Help screen. Press < X > to return to the working screen.

7.3-2 TSXV5, PMXV5 or PL7-MMIV5 Applications

TSX, PMX and MMX menu:

In this case, no file selection is required. Once selected, the TSX, PMX, or MMX menu displays a dialog box that lets the user confirm the selection made.

7.4 Transfer Menu

Transfer lets the user select the function to perform:

- **Write,**
- **Read,**
- **Comparison,**
- **Write & Protect,**
- **Checksum.**

Functions that appear dimmed in the menu may be functions that are not allowed, for example when attempting to select Protect for a TSXV3 or PL7-MMI application or those that require:

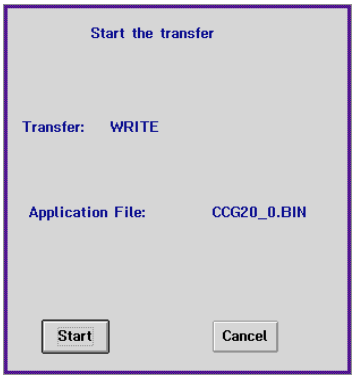
- Prior definition of source or destination files in the "Define" menu for TSX 17/27/47, TSXV3, TSXV4 and PMXV4 applications, or
- Selection of the type of application (TSX, PMX or MMX) from the "Define" menu for TSXV5, PMXV5 applications.

7.4-1 Write

This function **transfers** the application selected from the **Define** menu to the cartridge in the TSX TPE 01 cartridge programmer.
The cartridge must be:

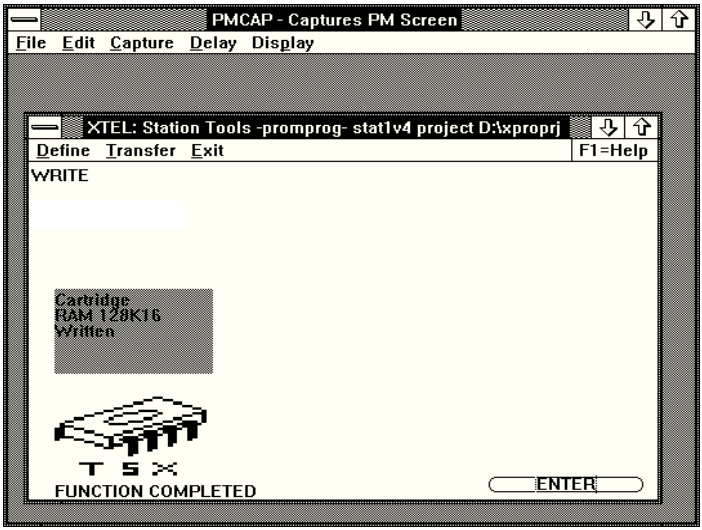
- Blank, if it is an EPROM,
- Compatible in size and in type with the selected application.

Once selected, the Write function displays the dialog box shown opposite.



Cancel Returns the user to the primary window,

Start Starts the operation and displays the dialog box below, once the process is complete,



During the write operation:

- The message "IN PROGRESS" is displayed,
- The percentage of the cartridge filled-up is displayed at the bottom left of the screen,
- An icon is displayed progressively as the memory cartridge is filled-up.

Cancel Interrupts the operation in progress.

After the write operation: The message "FUNCTION COMPLETED" is displayed.

ENTER Returns the user to the primary window.

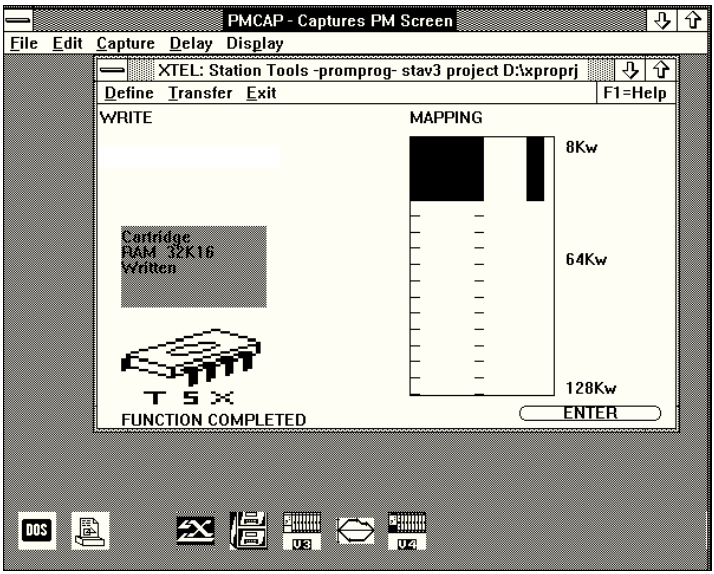
Special case of TSXV3 single and multiple cartridge applications

From the previously described dialog box:

Select **START** then **ENTER** to display the screen below. This screen shows the memory map in 8K word segments and a cursor (red for RAM or black for EPROM) that symbolizes the cartridge in the memory map. The cursor is proportional to the memory size and can be moved in 8K word segments using the <Ø> <≠> keys.

The following color code is used in the memory map:

- Yellow : Data field (cannot be saved to an EPROM cartridge),
- Blue : Program and constants field,
- Grey : Blank memory field.



Start Starts the write operation and displays the progress of the operation in real-time (percent of cartridge memory filled and an icon that forms as the cartridge fills).

Cancel Cancels the operation in progress.

For a multiple cartridge application, use the cursor to define the segments to write to a given cartridge and take the following precautions:

- Label the cartridges correctly to avoid any confusion when inserting them in the PLC,
- Define the memory segments for each cartridge without overlapping or blank spaces.

7.4-2 Read

TSX and PMX Applications

This function reads an application stored in a cartridge by generating an application file in the directory dedicated to the station.

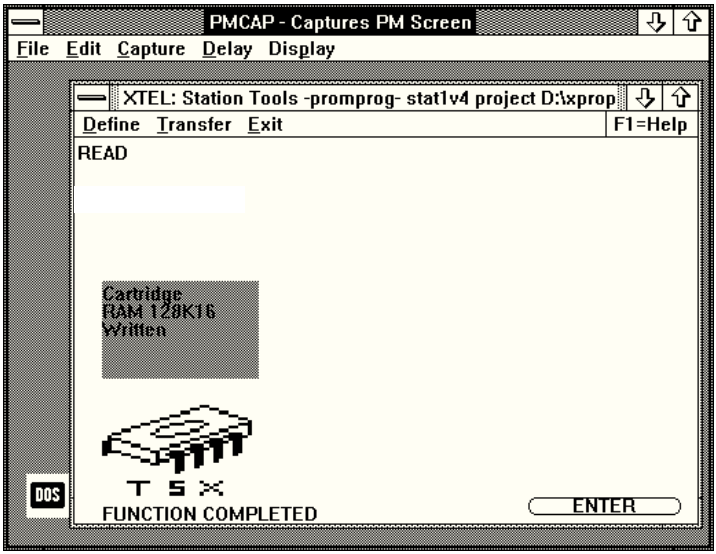
- TSX17/27/47, TSXV3 single cartridge, TSXV4 and PMXV4 applications:
  To be safe, rename the file from the Define menu to avoid overwriting files that may be located in the station directory.
- TSXV5 and PMXV5 applications:
  Files cannot be renamed and will therefore always overwrite any files present in the station directory.

MMX Application

The read function reads an application stored in a cartridge by generating a dedicated IMDSK. DAT application file in the XPROSYS/MMI directory. The file cannot be renamed as its name is set by the PL7-MMI program, therefore it overwrites any file already present.

The procedure is identical to the write procedure:
From the PROMPROG primary window, select the Transfer menu and the Read action.

- A dialog box is displayed:
  - **Cancel** : Returns the user to the primary window,
  - **Start** : Starts the read operation.
- Displays the working window allowing the user the option to **Cancel** the operation at any time.



ENTER Returns the user to the primary window.

7.4-3 Comparison

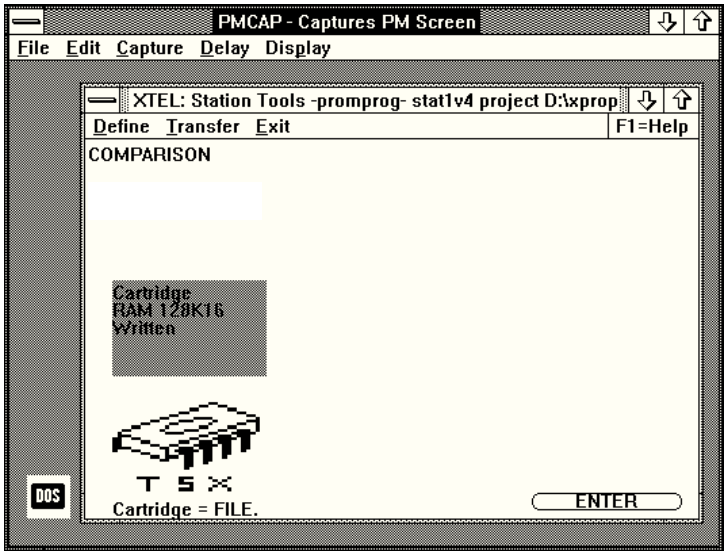
This function checks that the information stored in the cartridge is the same as the corresponding application files located in the:

- Station directory for TSX and PMX applications,
- XPROSYS\MMI directory for PL7-MMI applications.

The procedure is identical to the write procedure:
From the PROMPROG primary window, select the Transfer menu and start the Comparison action.

- The dialog box is displayed:
- **Cancel** : Returns the user to the primary window,
- **Start** : Starts the Comparison operation.

- Displays the working window allowing the user the option to **Cancel** the operation at any time.



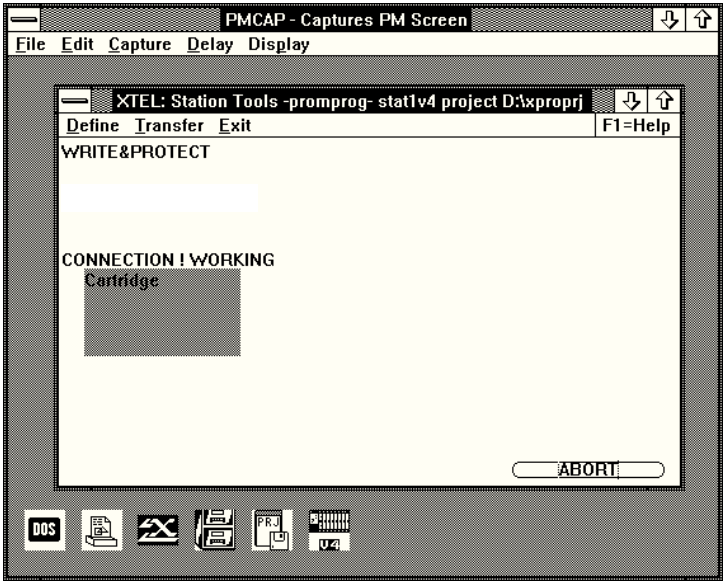
ENTER Returns the user to the primary window.

7.4-4 Write and Protect

This function writes to an EPROM cartridge and protects it against read and comparison actions. Once written and protected, a cartridge cannot be read using the terminals. This function is not available to TSXV3 and PL7-MMI applications.

The procedure is identical to the write procedure:
From the PROMPROG primary window, select the Transfer menu and the Protection action.

- A dialog box is displayed:
  - **Cancel** : Returns the user to the primary window,
  - **Start** : Starts the Protection operation.
- Displays the working window allowing the user the option to **Cancel** the operation at any time.



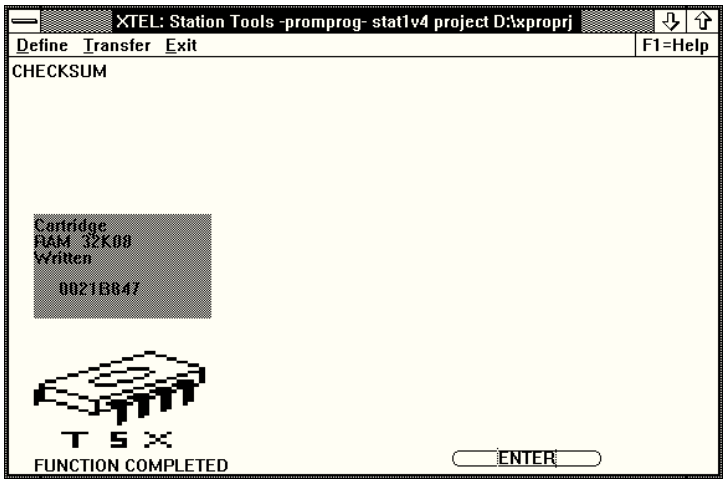
ENTER Returns the user to the primary window.

7.4-5 Checksum

This function calculates the hexadecimal value of the cartridge contents. The calculation is made on all bytes in the cartridge.

The checksum procedure is identical to the write procedure:
From the PROMPROG primary window, select the Transfer menu and the Checksum action.

- A dialog box is displayed:
  - **Cancel** : Returns the user to the primary window,
  - **Start** : Starts the Checksum operation.
- Displays the working window allowing the user the option to **Cancel** the operation at any time.



ENTER Returns the user to the primary window.