



Quick Start Training

RTU Software

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FLEXIBLE. RELIABLE. POWERFUL.

- **Software Overview**
- **RTU Overview**
- **Start an ISaGRAF Open project**
- **Configure an RTU using SXTTOOLS (basic setup with tags and export)**
- **Develop simple program and “Build” (compile) ISAGRAF project**
- **Download to RTU using the Tool Kit and ISaGRAF**

Requirements

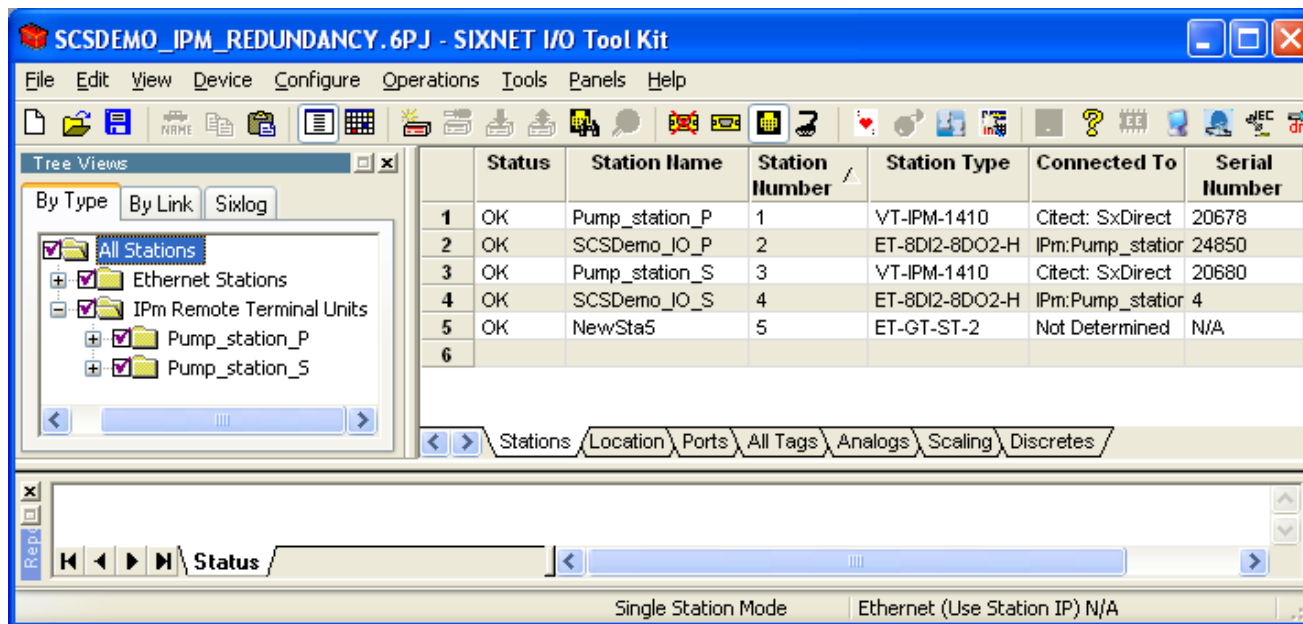


- **SIXNET I/O Tool Kit**
- **ISaGRAF Open Workbench**
- **IPM RTU Controller (with Ethernet or Serial connection)**
- **Licensing:**
 - ISaGRAF Open Key (SX-1131-S-x)
 - SIXNET Tool Kit licensing (SXTTOOLS-2; SCS option)

Sixnet Tool Kit



- Used to configure, load and maintain Sixnet RTUs and I/O modules
- Project management software
- Works with ISaGRAF Open programming software



- **ISaGRAF Open includes:**
 - ISaGRAF v5 editor
 - Sixnet enhancements
 - v3 features for backward compatibility to installed Sixnet RTU base
 - Differences.pdf > C:\Program Files\SIXNET ISaGRAF Open\Documentation 5.1\Users Guide\English
- **Based on the International Standard IEC 61131-3**
- **ISaGRAF supports all five programming languages:**
 - Sequential Function Chart
 - Ladder Diagram
 - Structured Text
 - Instruction List
 - Function Block Diagram
 - (also supports Flow Chart)

ISaGRAF Open



The screenshot displays the ISaGRAF Open software interface. The main window title is "SIXNET - [PumpOne (* *) - Link architecture]". The menu bar includes File, Edit, Insert, Project, Tools, Debug, Options, Window, and Help. The toolbar contains various icons for file operations, navigation, and execution. The Project Tree View on the left shows a hierarchical structure:

- PumpOne
 - Link architecture
 - Hardware architecture
 - Binding list
 - SIXNET_RTU_CFG
 - Res1
 - I/O Wiring
 - Programs
 - PumpOne (* Basic Training *)
 - Unt_LD
 - Functions
 - Function blocks

The right pane shows the expanded view of "1: Res1 (* Resource Number 1 *)", containing:

- Parameters
- Variable Groups
- Programs
 - PumpOne (* Basic Training *)
 - Unt_LD
- Functions
- Function blocks

The Output window at the bottom shows the following text:

```
Building configuration data
Linking object files
Relocating object files
Post-compiling code
0 error(s), 0 warning(s)
Compiling resources
0 error(s), 0 warning(s)
RES1: 0 error(s), 0 warning(s)
```

The status bar at the bottom left shows "SALES06.JoeS" and the bottom right shows "NUM".

IPM Controller



- **Quick start for software programming that will work with any RTU**
- **Embedded Linux controller**
- **Shared IO database**
- **Supports a number of running applications**
 - Alarming, datalogging, custom C application, protocol conversion, web server



Main Summary



- 1. ISaGRAF Open - Create and name new project**
- 2. Sixnet Tool Kit - Start project**
- 3. Configure RTU**
- 4. Export Tags to ISAGRAF Project**
- 5. Develop simple program & build (compile) ISAGRAF program**
- 6. Load IPM Controller with Tool Kit**
- 7. Load ISAGRAF Program with the Open Workbench**
- 8. Load Tool Kit & ISaGRAF program in one step**
- 9. Exercise program**

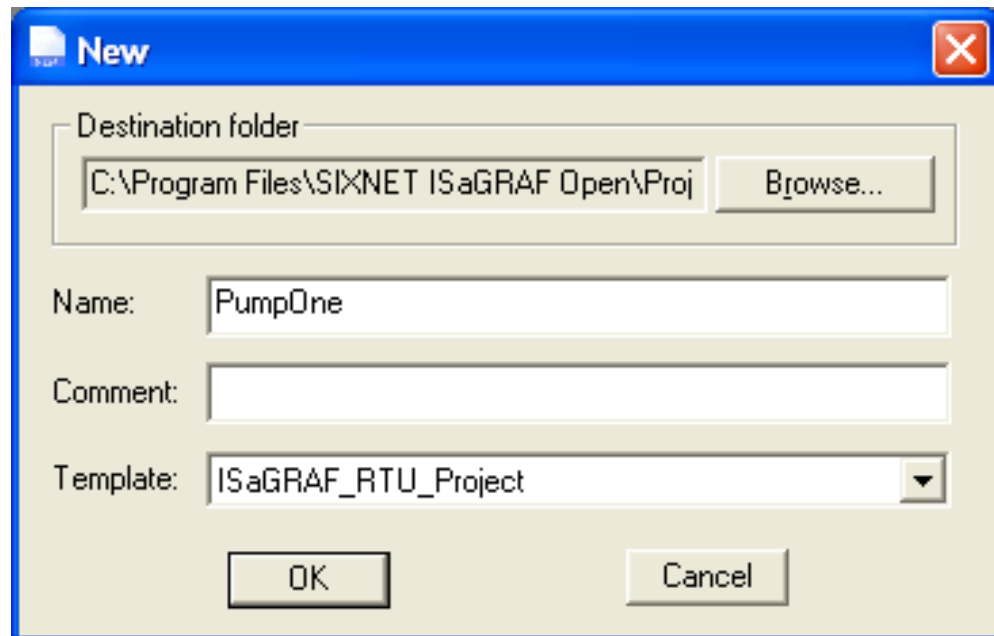
Let's get started ...

ISAGRAF Open: Create & Name New Project



- Run the Open Workbench
- File > New Project (name = PumpOne)
- Name and select Template (ISaGRAF_RTU_Project)
- Save

Step one complete!



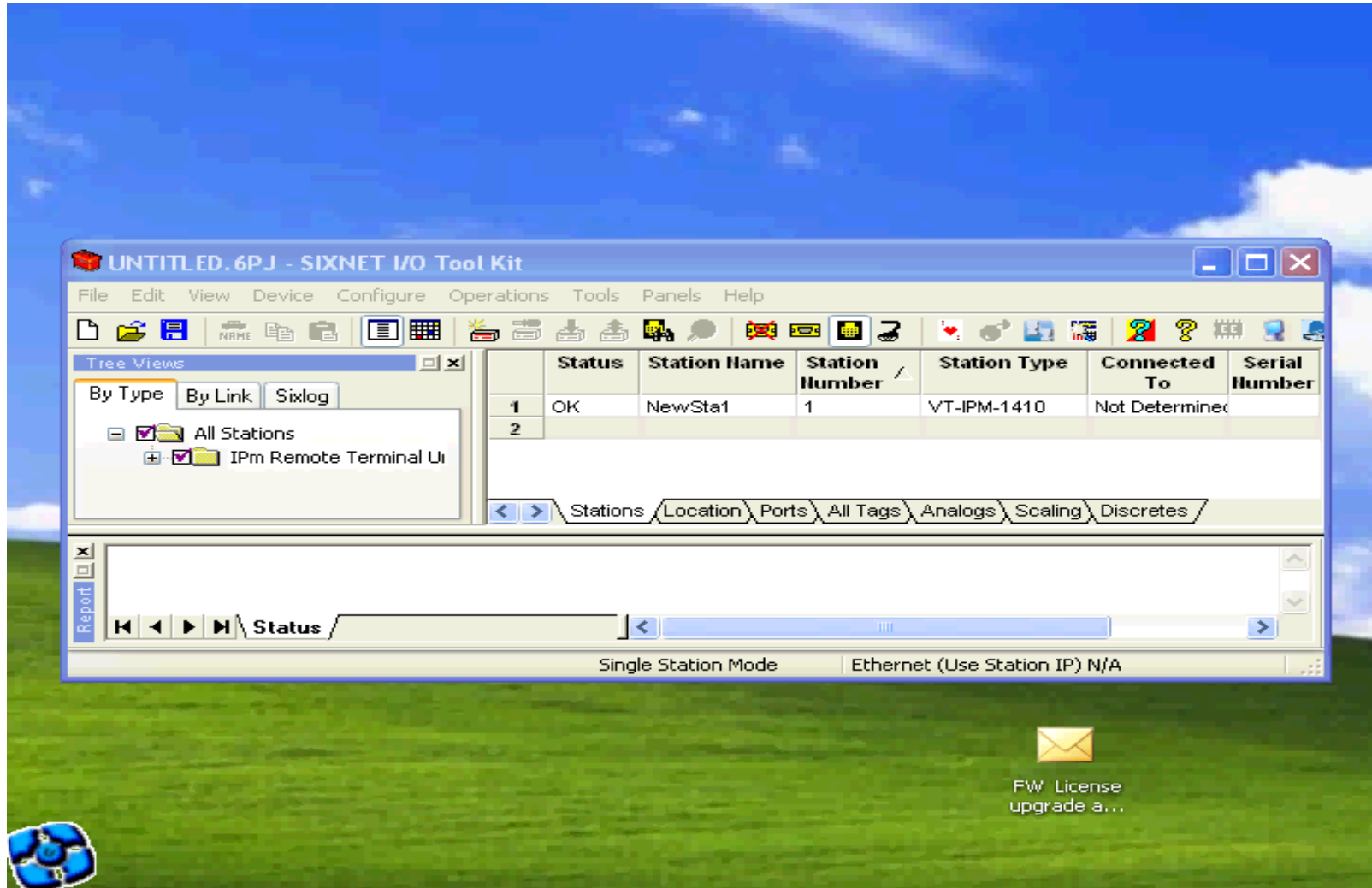
Sixnet Tool Kit: Start Project



- **Open Tool Kit**
- **Start new project (File > New Project)**
- **Select project name**
 - Default project location = C:\SIXNET Tools\Projects
- **Save: this will automatically lead to the RTU configuration**
- **Add RTU station to configuration**
- **Configure station:**
 - RTU Type
 - Setup ports
 - Add a virtual I/O
 - Add a DI module and Tag I/O (Tags = TurnOnMotor1 & Level)
 - Add a DO module and Tag I/O (Tag = Motor1)

***Step two and
three complete!***

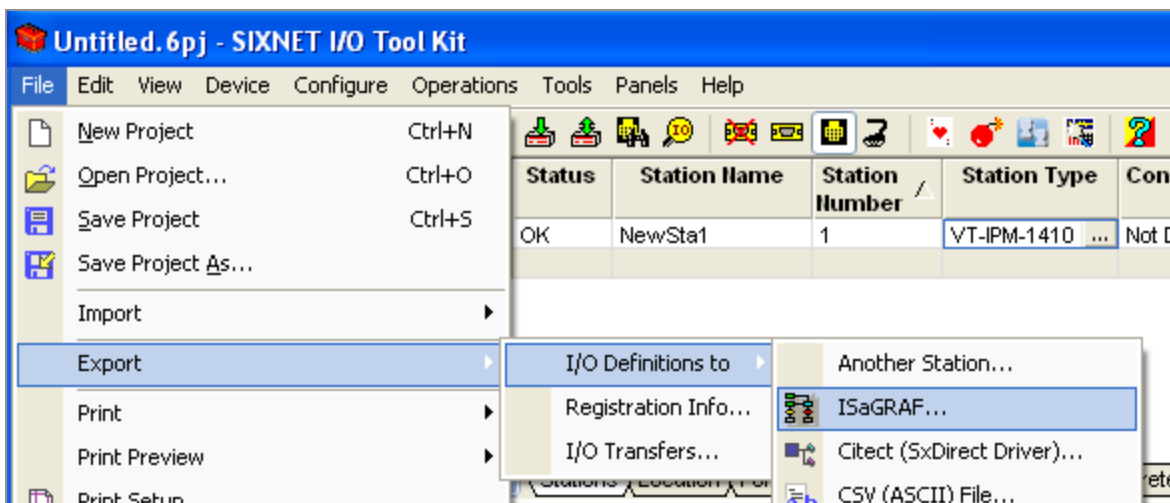
Sixnet Tool Kit IPm Setup



Export Tags to ISAGRAF Project



- **Goto File Menu > Export > I/O Definitions > ISAGRAF**
 - Select ISAGRAF Open
 - Browse to Project file: Location = C:\Program Files\SIXNET ISaGRAF Open\Projects\ISaGRAF 5.1\Prj
 - Select RTU
 - Finish
 - Note: View video to review process



Step four complete!

Export Tags



The screenshot shows the 'PumpOne.6pj - SIXNET I/O Tool Kit' application window. The interface includes a menu bar (File, Edit, View, Device, Configure, Operations, Tools, Panels, Help), a toolbar with various icons, and a 'Tree Views' panel on the left with 'By Type', 'By Link', and 'Sixlog' tabs. The 'By Type' tab is active, showing a tree view with 'All Stations' selected. The main area displays a table with the following data:

	Status	Station Name	Station Number	Station Type	Connected To	Serial Number
1	OK	Pump1	1	VT-MIPM-131- ...	Not Determined	23423
2						

Below the table is a breadcrumb navigation path: Stations > Location > Ports > All Tags > Analogs > Scaling > Discretes. At the bottom, a 'Report' window shows the following text:

```
1 DO tags exported.  
Total tags exported = 3
```

The status bar at the bottom of the application window displays: VT-MIPM-131-D : Pump1 | Single Station Mode | Ethernet (Use Station IP) 10.1.0.1

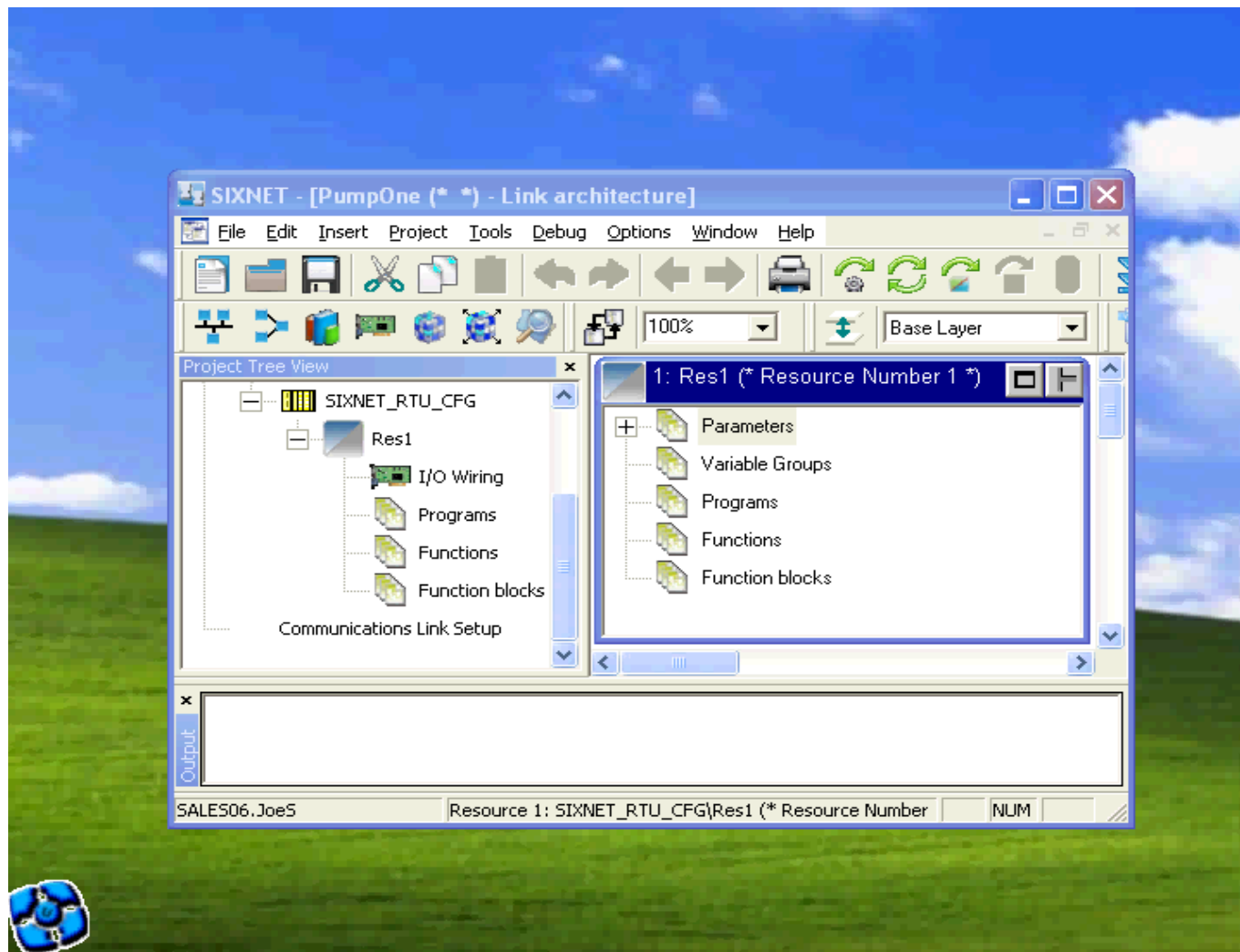
Develop Program & Build (Compile)



- **Open project**
- **From Resource window right click on Programs and Add Program Type (use FBD)**
- **Open FBD program**
- **Select F3, or the Function block symbol and add AND block**
- **Select F2, or Variable symbol and add variables accordingly**
- **Select F4 function to connect variable to function block**
- **Save**
- **Compile**

Step five complete!

Build ISAGRAF Program



Load IPM Controller with Tool Kit



- **Load Tool Kit configuration first to be sure the port settings are correct**
- **By default all IPM stations are 10.1.0.1**
- **Tools > Device Menu > Select**
 - Choose Serial or Ethernet
- **Ok**
- **Operations Menu > Load > Basic Settings**

Step six complete!

Load Tool Kit Project



The screenshot displays the 'PumpOne.6pj - SIXNET I/O Tool Kit' application window. The interface includes a menu bar (File, Edit, View, Device, Configure, Operations, Tools, Panels, Help), a toolbar with various icons, and a 'Tree Views' panel on the left with options for 'By Type', 'By Link', 'Sixlog', and 'All Stations'. The main area features a table with the following data:

	Status	Station Name	Station Number	Station Type	Connected To	Serial Number
1	OK	Pump1	1	VT-IPM-1410	Not Determined	18790
2						

Below the table are navigation tabs: Stations, Location, Ports, All Tags, Analogs, Scaling, Discretes. A 'Report' window is open, showing configuration logs for 'ringmon' and 'scanRate'.

```
/etc/stacfg/ringmon.config:[ringmon],key = numSwitches,old value = , new value = 0
/etc/stacfg/ringmon.config:[ringmon],key = enabled,old value = , new value = 0
/etc/stacfg/ringmon.config:[ringmon],key = scanRate,old value = , new value = 1
```

The status bar at the bottom indicates 'VT-IPM-1410 : Pump1', 'Single Station Mode', and 'Ethernet (Use Specific IP) 10.1.0.1'.

Load ISAGRAF Program with the Open Workbench



- Goto Tools Menu (or Project Tree View) > Communication Link Setup
- Select Device > Single Station
- Select “use project file settings”
Browse to project file
- Ok

Note: The IP address or serial port settings are found in the Tool Kit project file automatically. Otherwise, select “Use these settings” for manual purposes.

See next slide to complete the load.

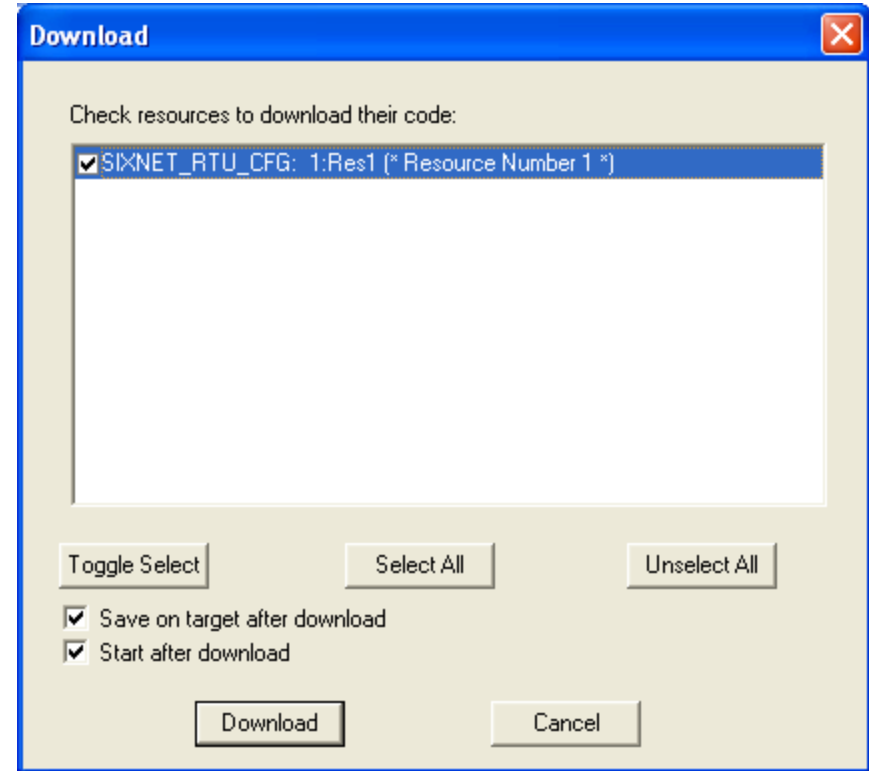
The screenshot shows a dialog box titled "Link Setup" with a blue header bar. It is divided into two main sections: "Communication to station:" and "Station address settings:". In the "Communication to station:" section, the "Device:" dropdown menu is set to "Ethernet". Below it, three radio buttons are present: "Single station" (which is selected), "Network mode", and "Passthru mode". The "Station address settings:" section has two radio buttons: "Use project file settings:" (selected) and "Use these settings:". Under "Use project file settings:", there is a folder icon and the path "C:\SIXNET Tools\Projects\PUMPONE.6PJ". Below this, the "Station name:" dropdown is set to "PumpOne" and the "IP Address:" dropdown is set to "10.1.0.1". Under "Use these settings:", the "Station number:" text box contains "ANY" and the "IP Address:" text box contains "10 . 1 . 0 . 1".

Load ISAGRAF Program



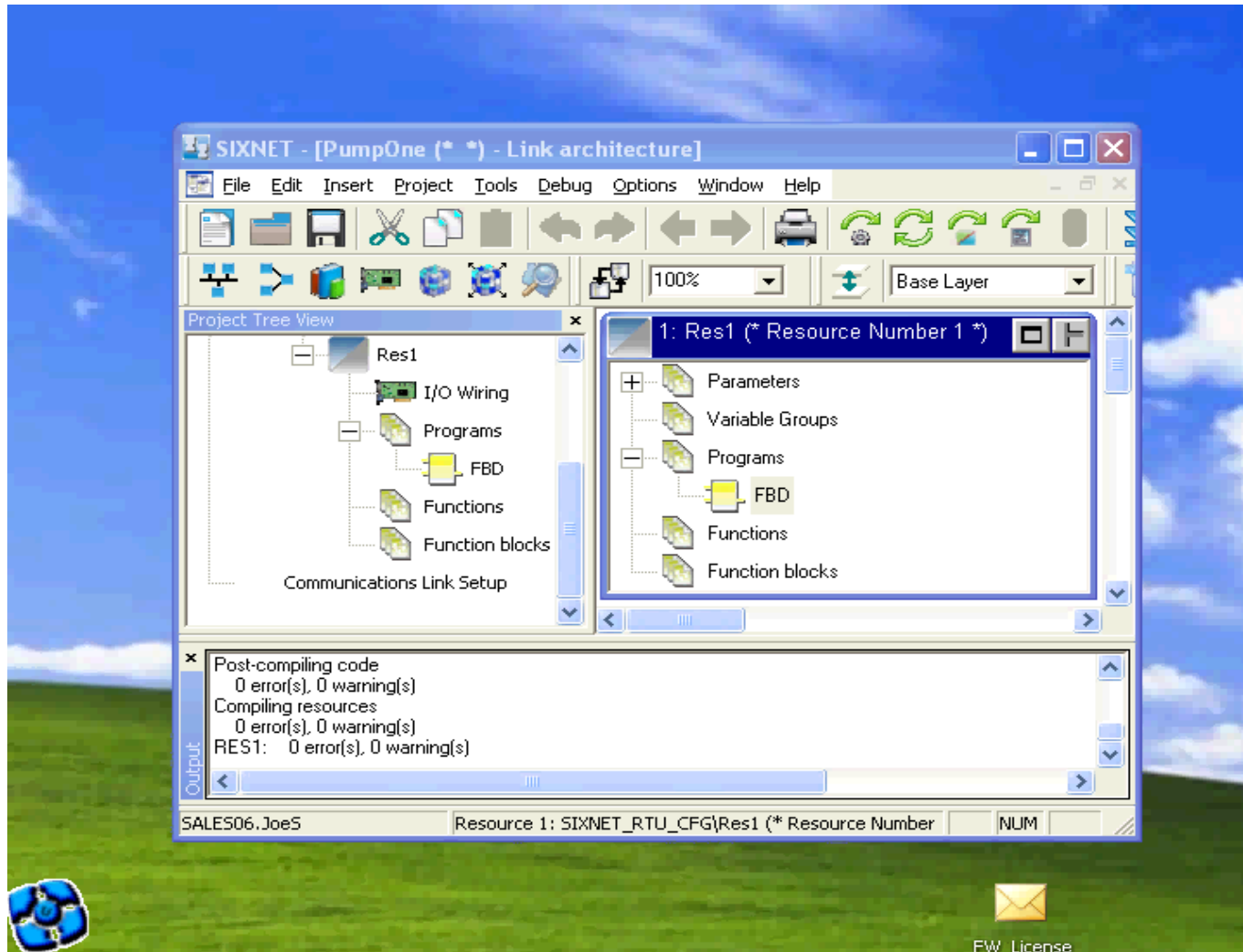
- From Main Workbench window select Debug Menu > Download
- Select Resource (Check box)
- Save on target after download
- Start after download
- Download

Program is now running in RTU!



Step seven complete!

Load ISAGRAF Project



Load Tool Kit & ISaGRAF program in one step

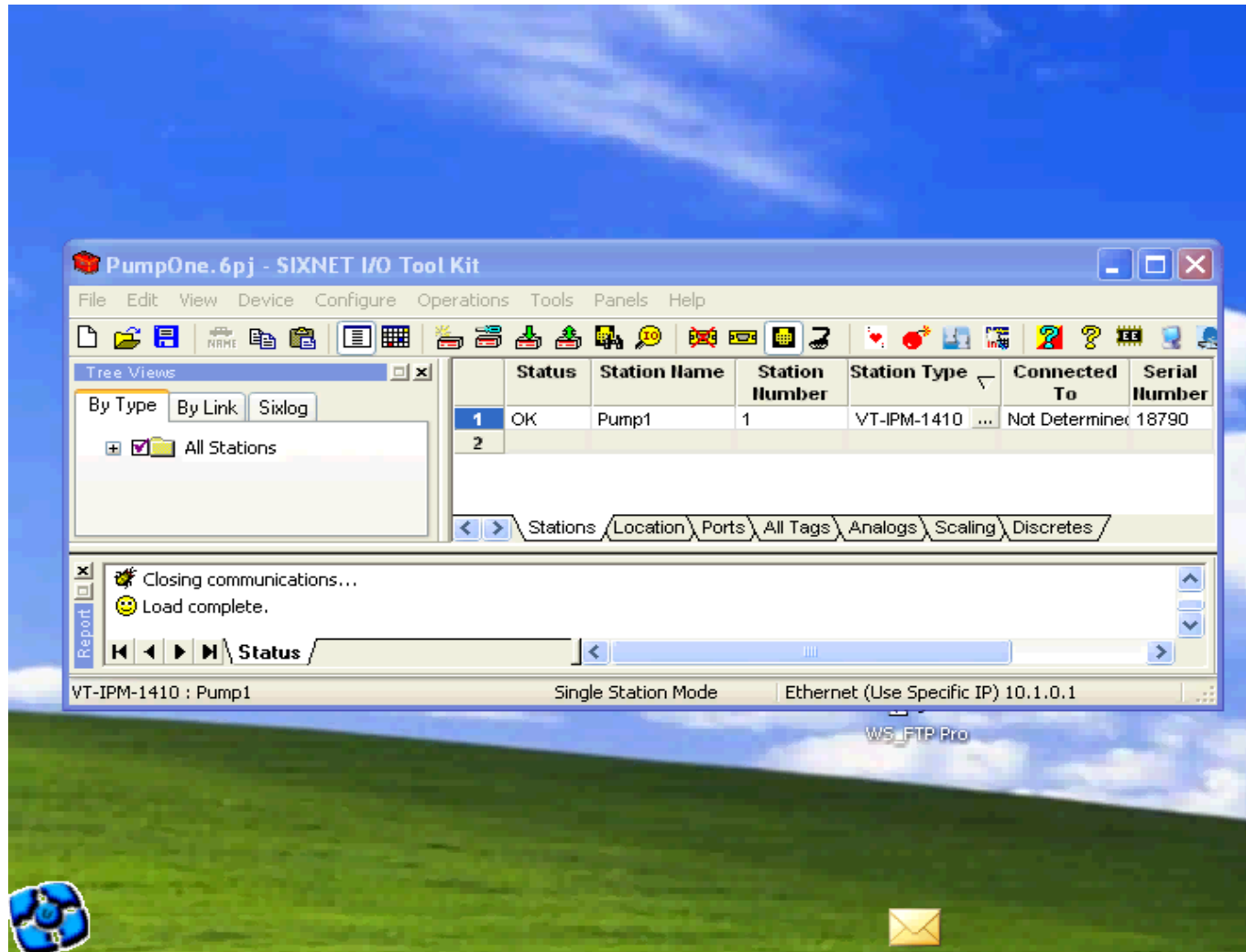


- From the Tool Kit setup “Files to Load” in RTU configuration
- From the ISaGRAF Tab Check “Load an ISaGRAF program”
- Run time version RTU
- Select project: appli.X6M
- To Load: Operation Menu > Load > Advanced Selected, or Predefined files

A screenshot of the ISaGRAF software interface. The 'ISaGRAF' tab is active, with sub-tabs for 'Datalogging' and 'Other'. A checkbox labeled 'Load an ISaGRAF program:' is checked. Below it, the 'Run time version:' dropdown menu is set to 'RTU'. A 'Project...' button is followed by a text field containing the path 'C:\Program Files\...AF Open\Projects\ISaGRAF 5.1\Prj\PumpOne\ISA3\Ap\RES1\appli.X6M'. A 'Configuration...' button is followed by an empty text field. At the bottom, there is an unchecked checkbox for 'Load project archive'.

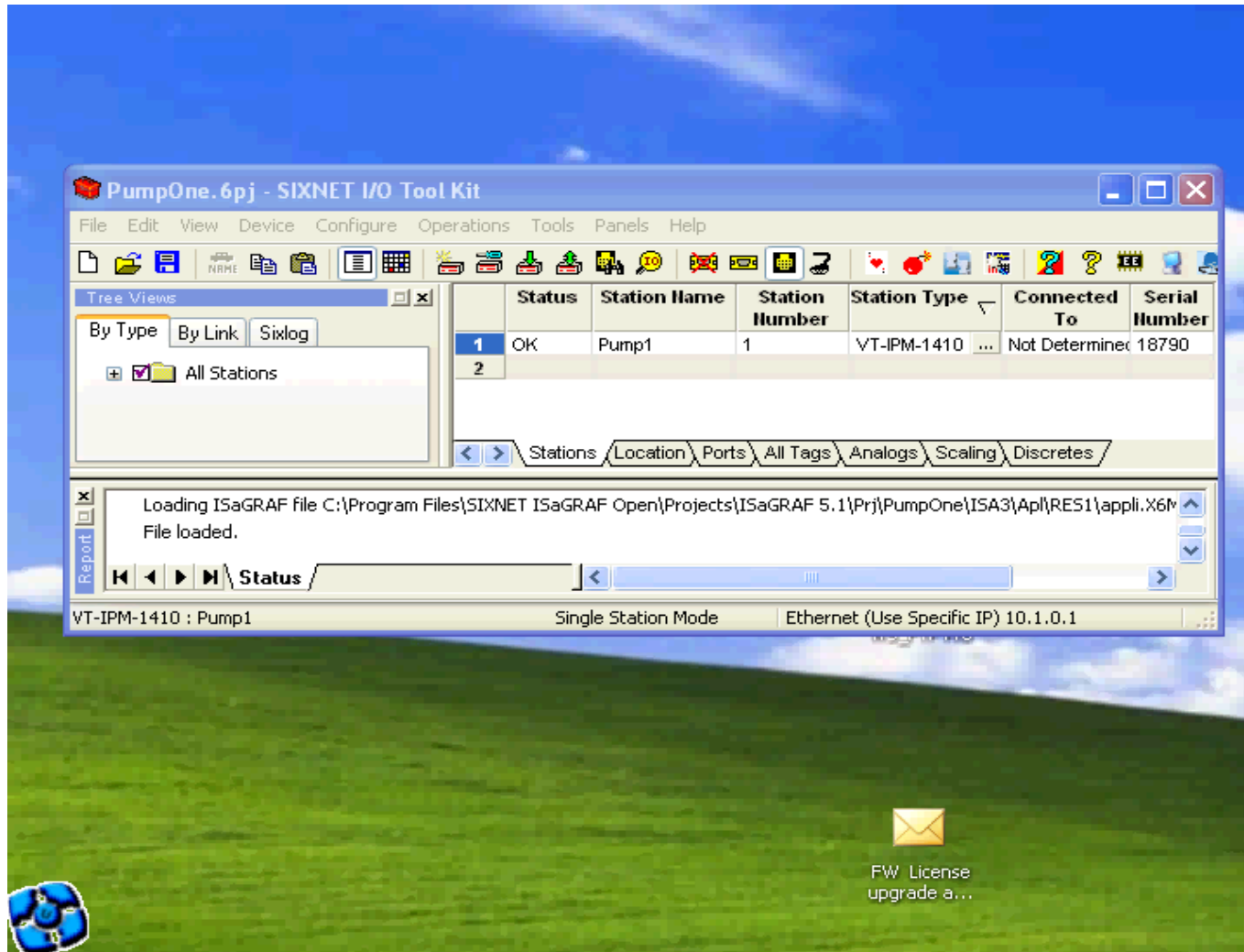
Step eight complete!

Load Tool Kit and ISaGRAF Project



- **From the Sixnet Tool Kit run Test I/O to station**
 - Test IO will work if Virtual Input modules are used. If Onboard Inputs are used a the RTU will need to have a wired input or use the Workbench debug lock feature.
 - Make sure the device menu is setup accordingly
- **Operations: Test I/O**
- **Turn on DI Tags “TurnOnMotor” & “Level”**
- **Result = DO Tag “Motor1” will turn On**

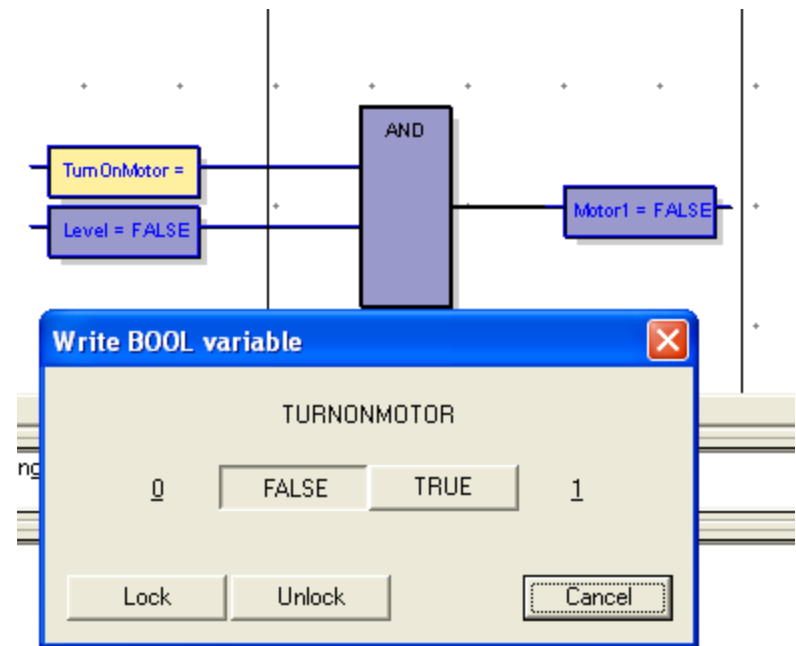
Test Program with Test I/O



Test Program with the ISaGRAF Debugger



- Run ISAGRAF Debugger: Debug > Debug Target
- Open the program
- Double click on Input Tag
- Select Lock
- Double click on Tag again
- Select “True”
- Do this for both Inputs & Motor1 will turn ON



Step nine complete!



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