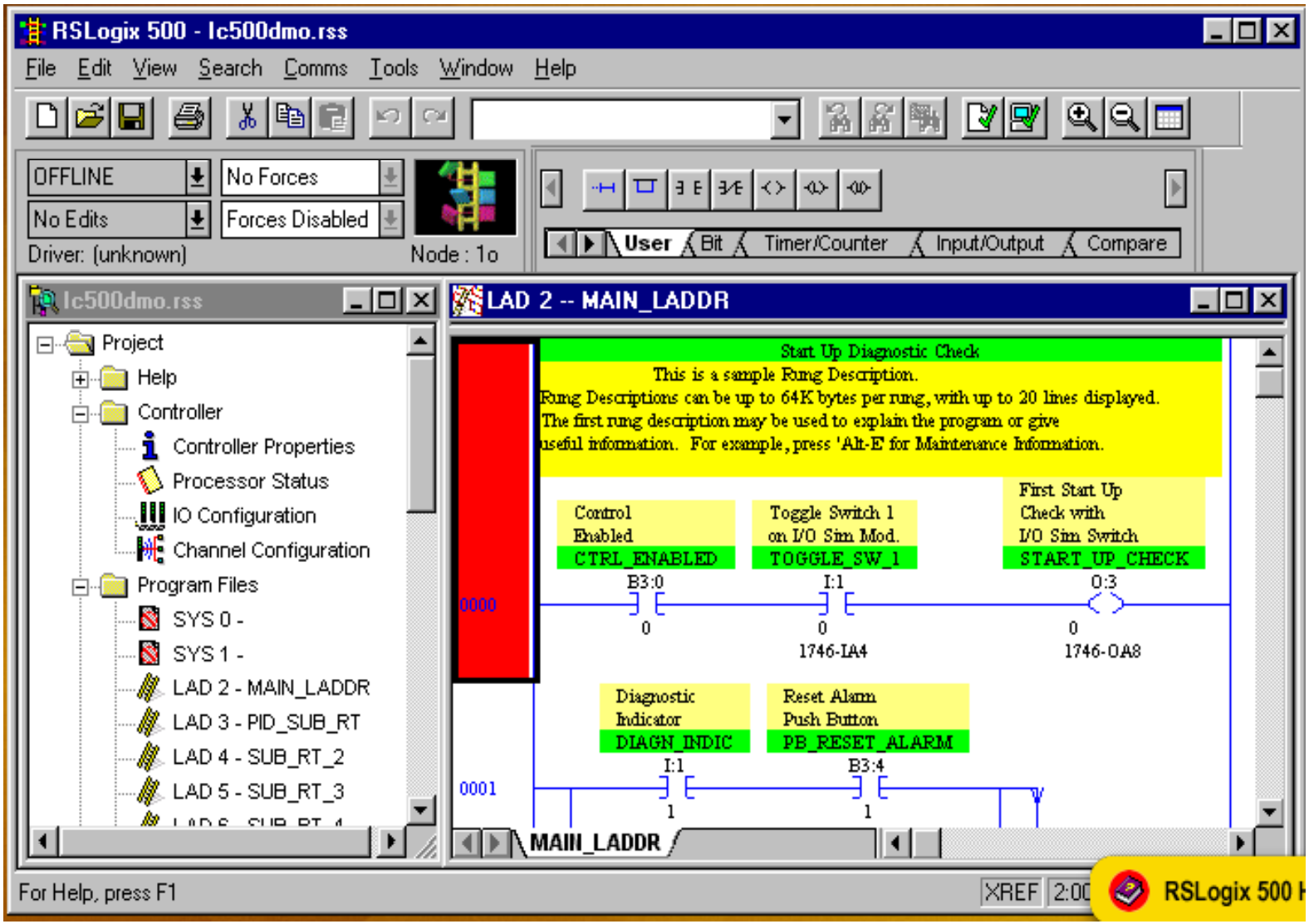
Pertemuan ke-7

Programming Software

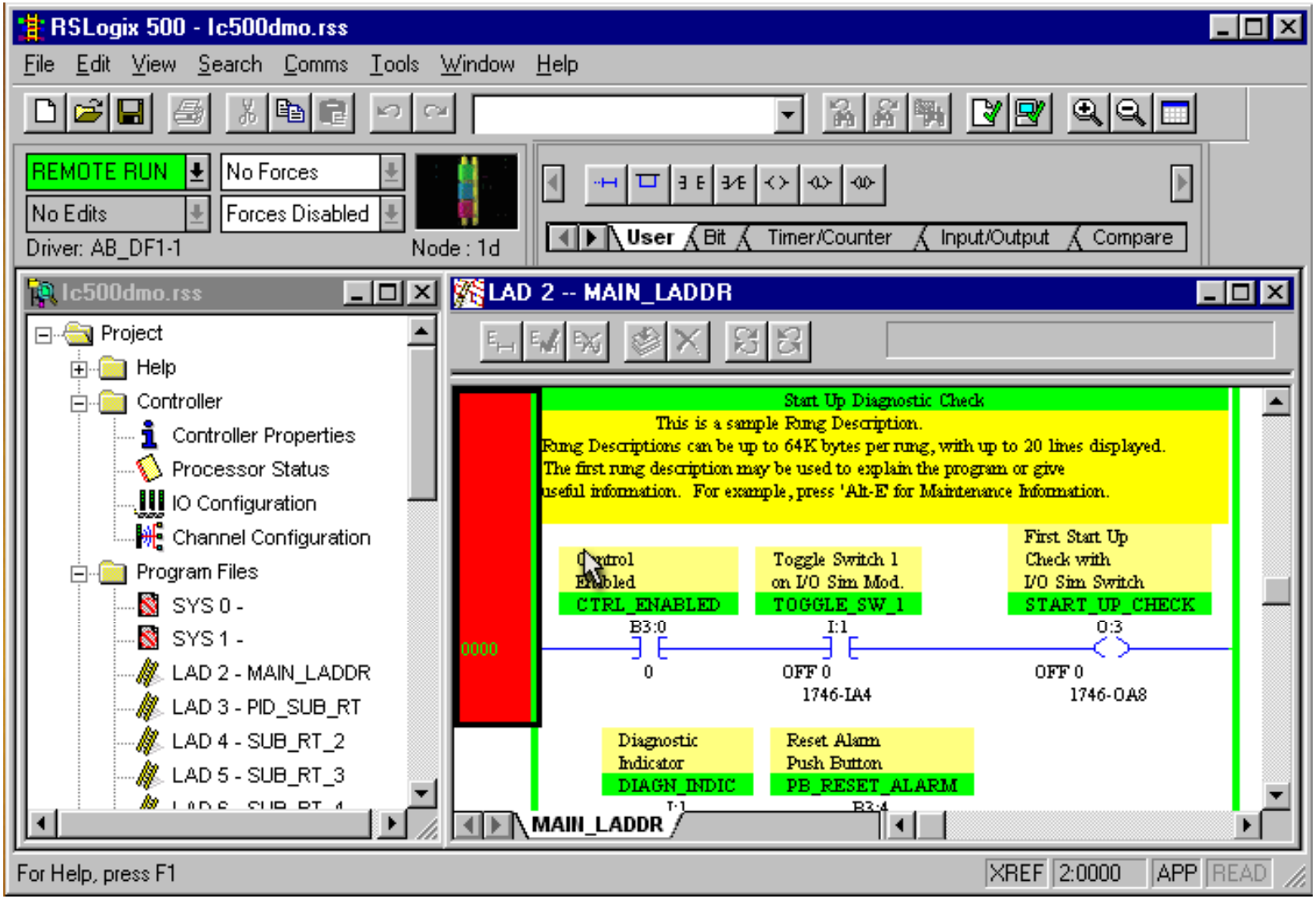
Objektif

- Mengenal Programming Software dari Allen Bradley RSLogix 500
- Memahami bagaimana bahasa ladder program dapat mengkomunikasikan informasi ke PLC
- Mengidentifikasikan mode operasi yang sering ditemukan di PLC

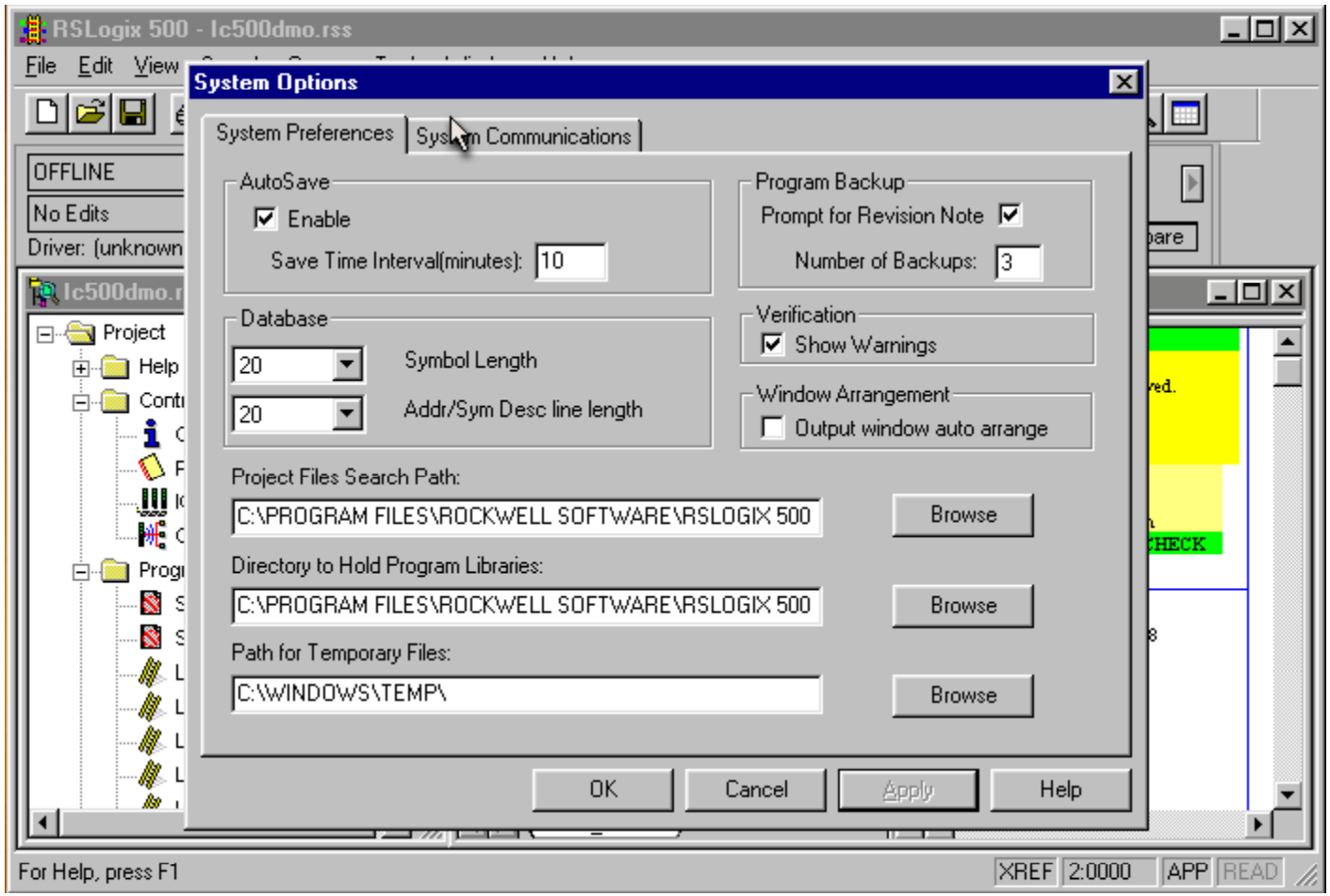
PLC Programming Software



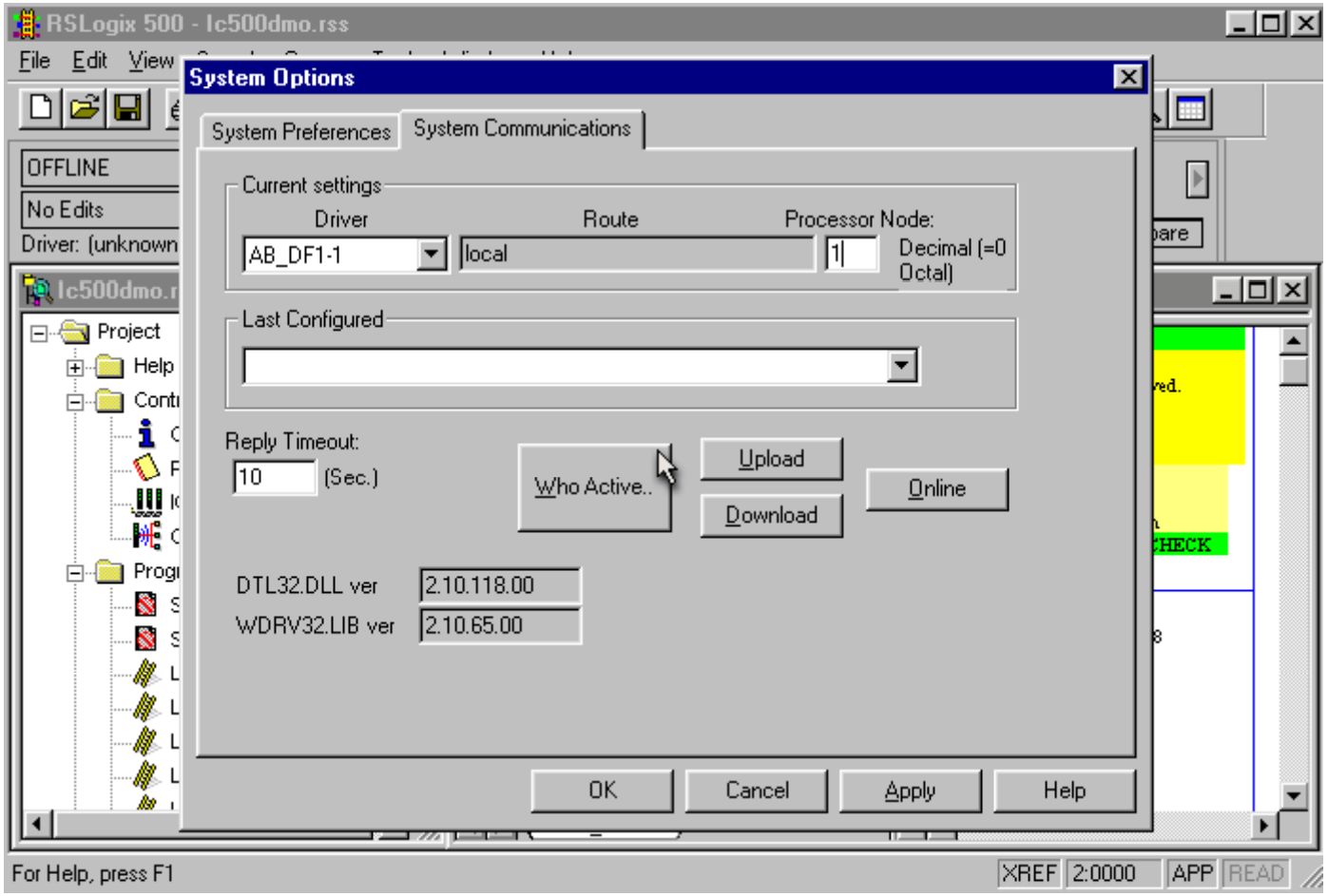
PLC On-line Program



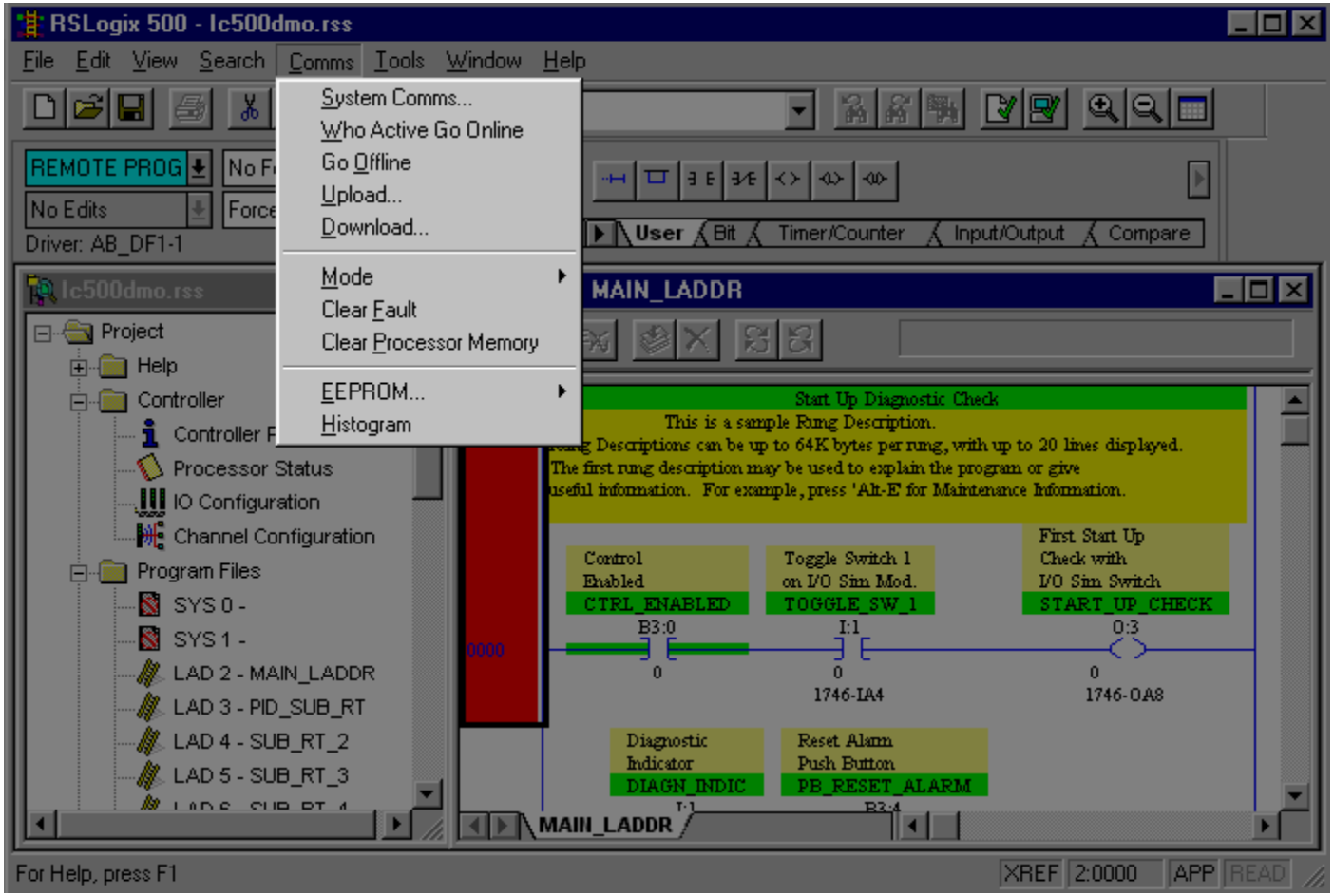
Download Option



PLC Communication Set-up



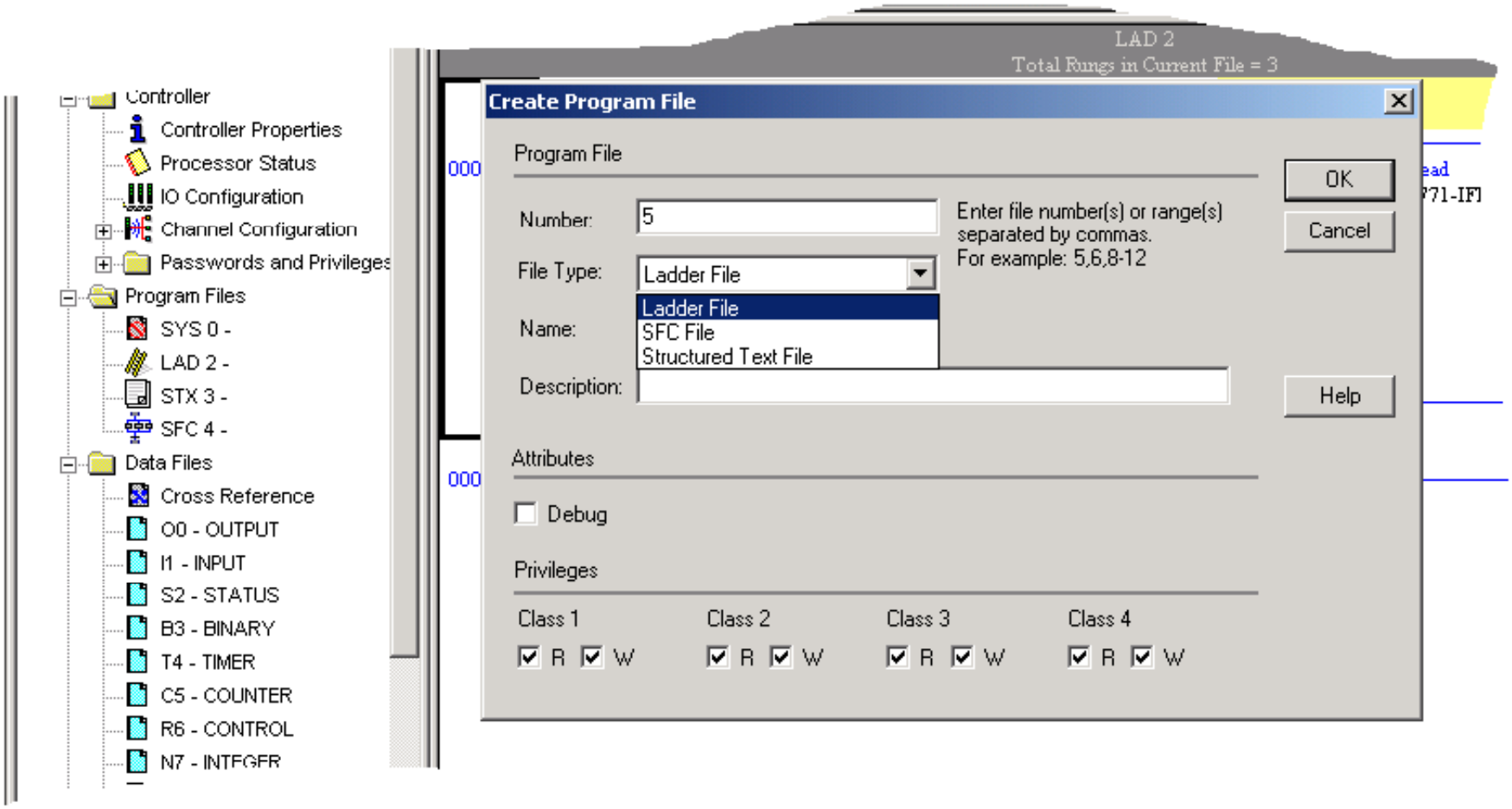
PLC Communication Option



Bahasa Pemrograman PLC

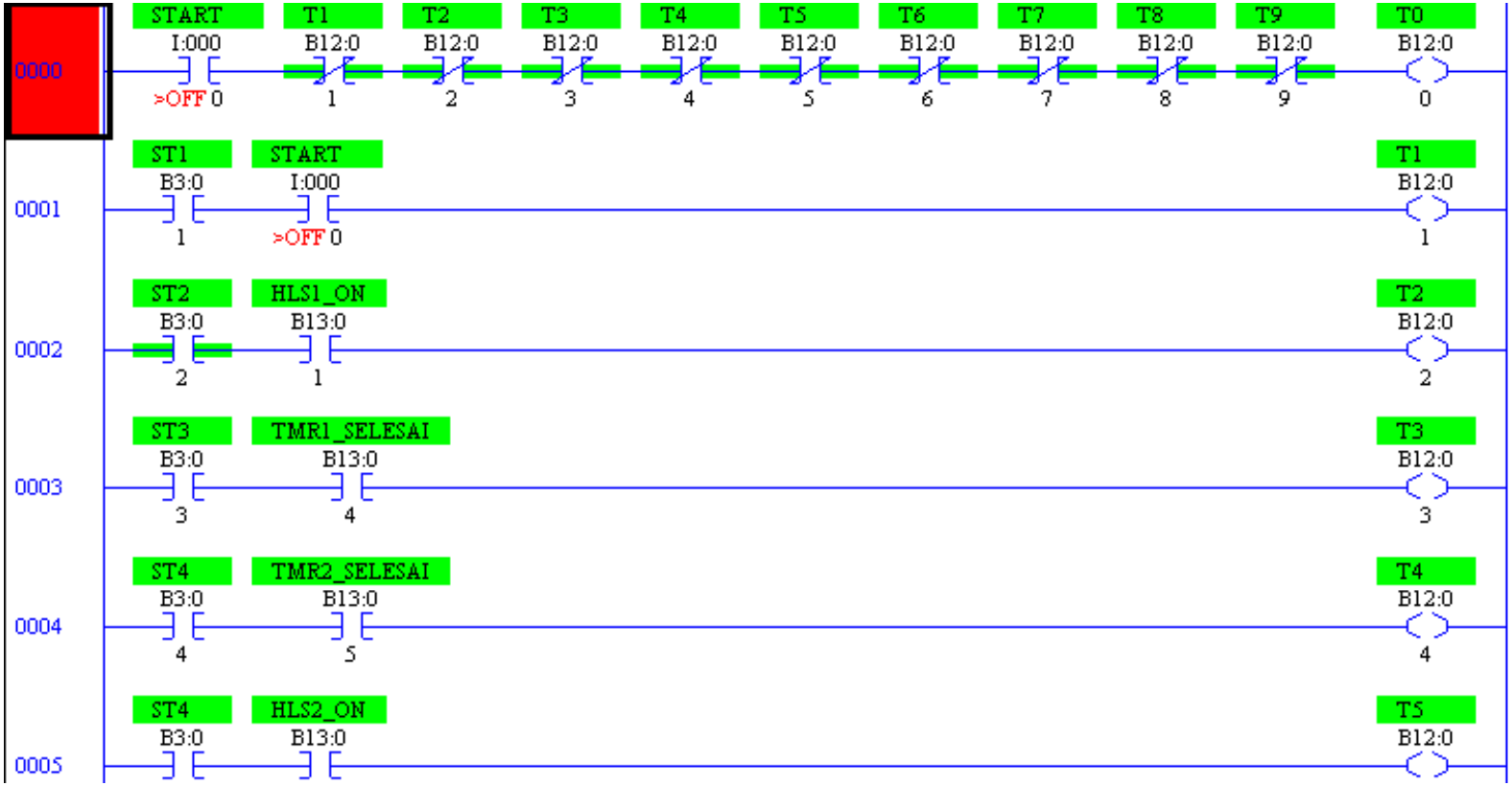
- Ladder Logic (LL)
- Sequential Function Chart (SFC)
- Function Block Diagram (FBD)
- Structured Text (ST)
- Instruction List (IL)

Program Files(PLC 5)



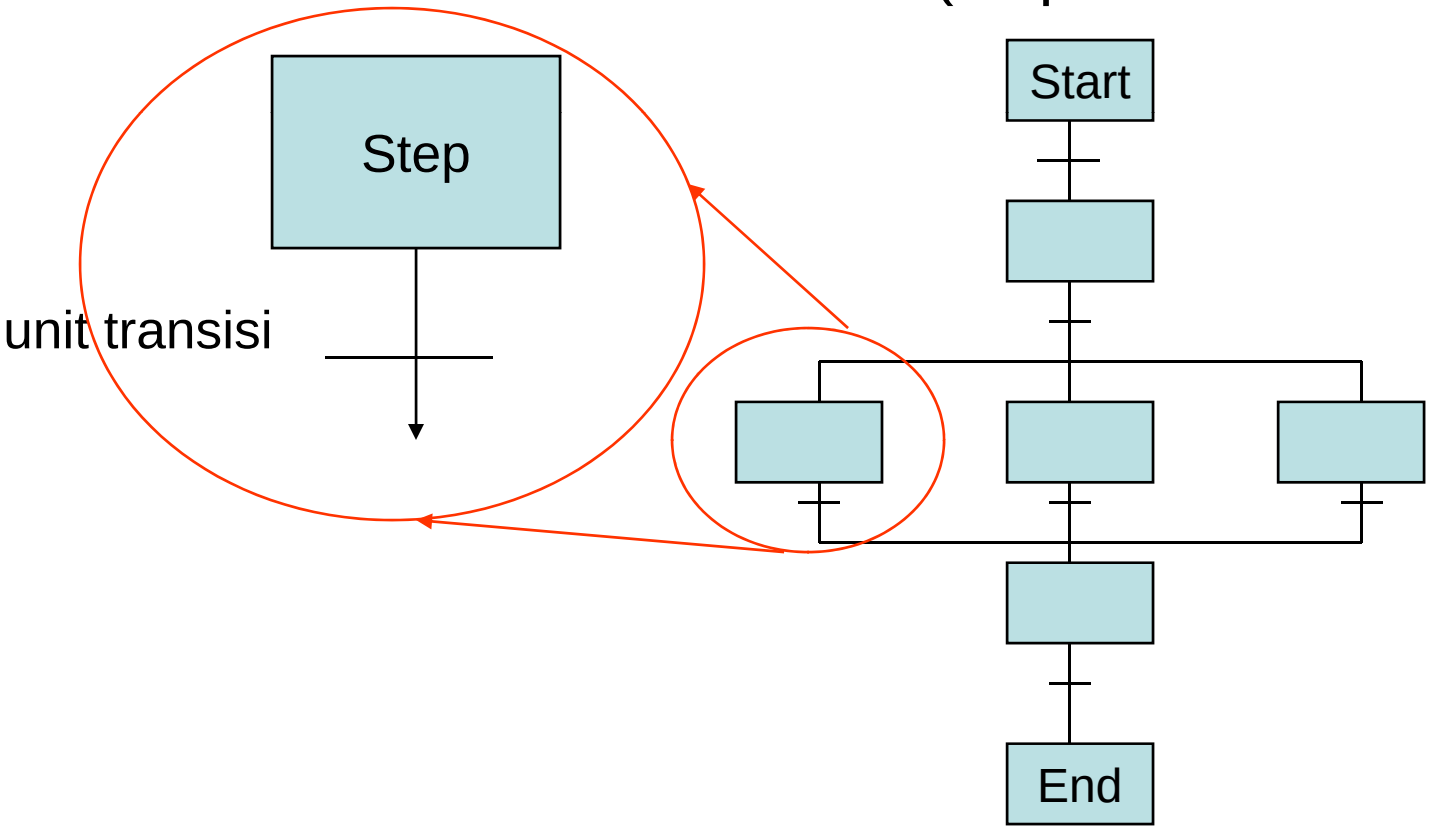
Ladder Logic

- Bahasa Ladder Logic adalah bahasa yang paling sering digunakan di sebagian besar PLC



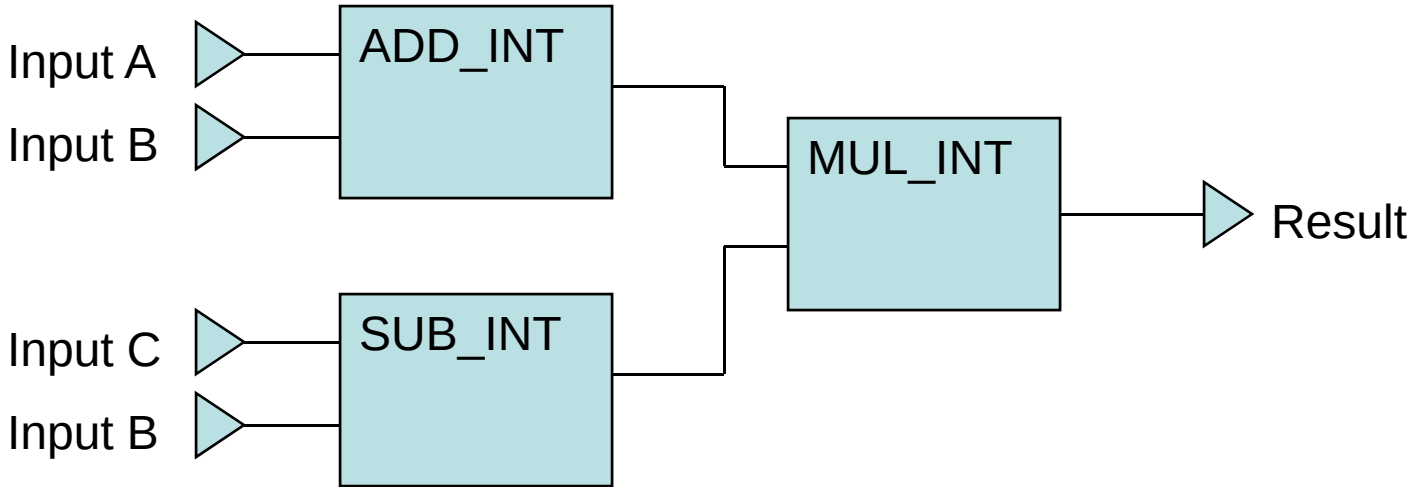
Sequential Function Chart

- SFC adalah metoda pemrograman sistem kontrol yang menggunakan pendekatan lebih tersetruktur.
- SFC terdiri dari function block (step dan unit transisi)



Function Block Diagram

- FBD adalah unit program terorganisasi dalam sauatu block yang dapat menyediakan besaran keluaran berdasarkan besaran input, parameter dan algoritma dalam unit ini
- Dapat digunakan secara berulang pada beberapa bagian program dengan harga masukan yang berbeda sehingga menghasilkan keluaran yang berbeda pula



Instruction List

- Penulisan program berbasis teks
- Mirip dengan bahasa pemrograman tingkat rendah lain seperti Assembly

- Contoh Program :

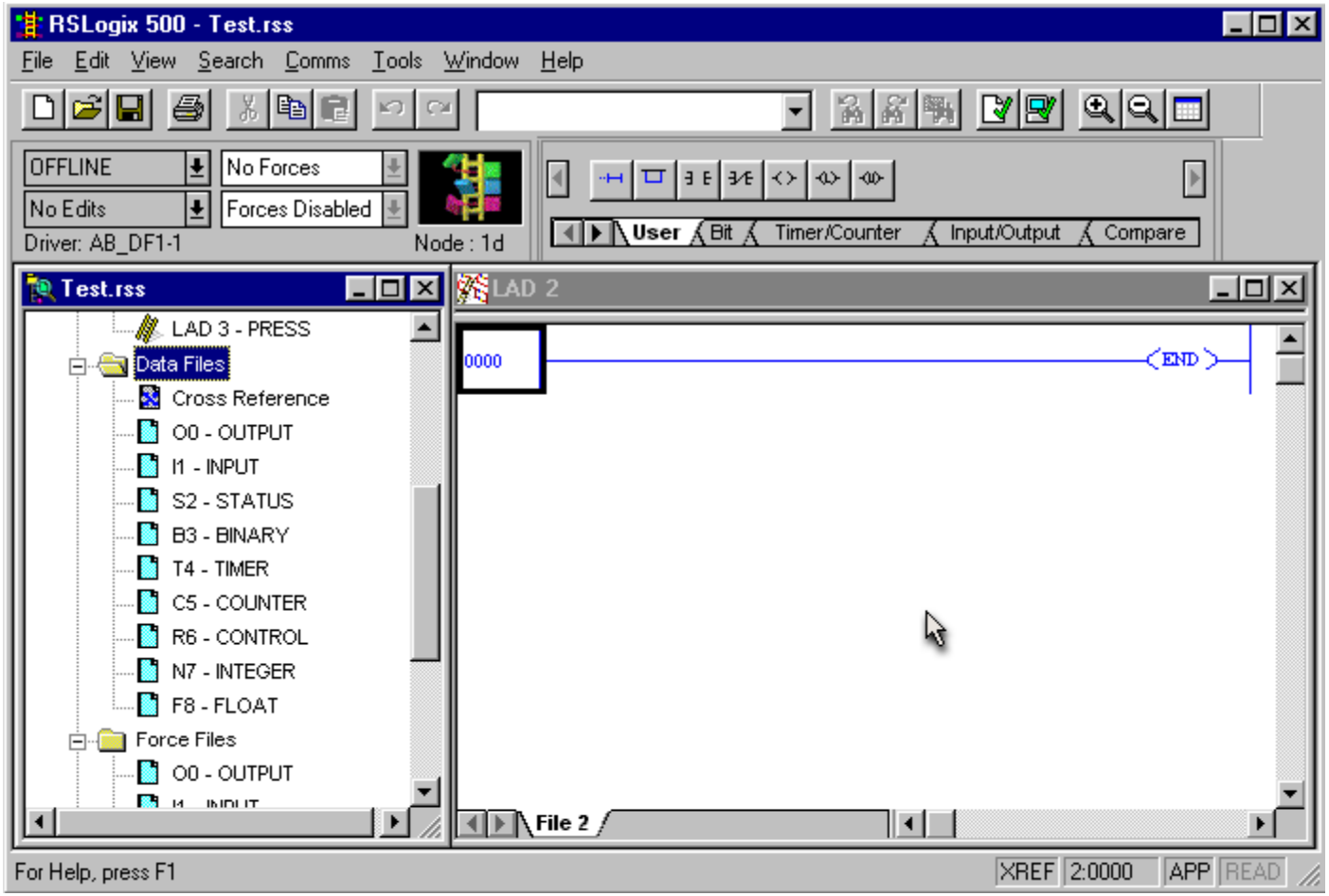
```
>>>>>>>>>>>>>>>>>>>>Instruction List Start>>>>>>>>>>>>>>>>>>>>
Start    LD          100000
         AND         100001
         AND   NOT   100002
         OUT         000001
>>>>>>>>>>>>>>>>>>>>Instruction List End>>>>>>>>>>>>>>>>>>>>
```

Structured Text

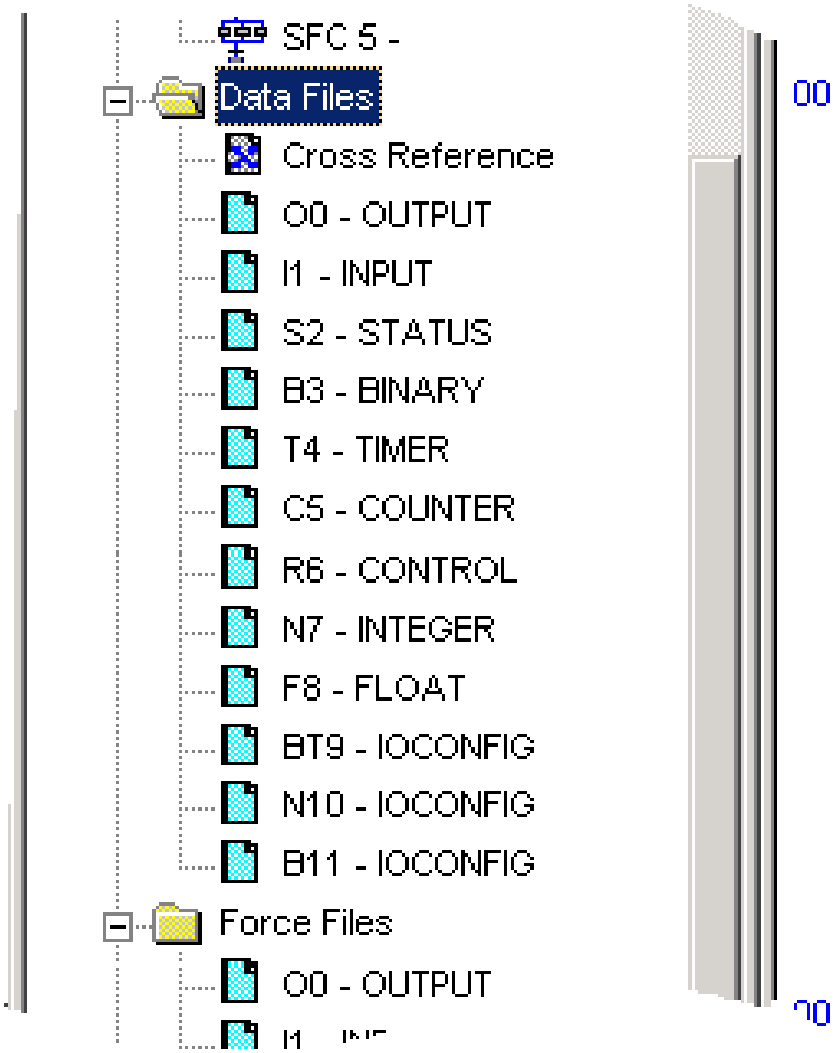
- Penulisan program berbasis teks
- Mirip dengan bahasa pemrograman tingkat tinggi lain seperti Basic, Pascal
- Contoh Program :

```
>>>>>>>>>>>>>>>>>>>>Structured Text Start>>>>>>>>>>>>>>>>>>>>
(*Invocation*)
(*Int*) :- DIV_INT          (IN1 :=, (*INT*)
                            IN2 := (*INT*));
LD      100000
ADD     100001
OUT     000002
>>>>>>>>>>>>>>>>>>>>Structured Text End>>>>>>>>>>>>>>>>>>>>
```

PLC Data Files



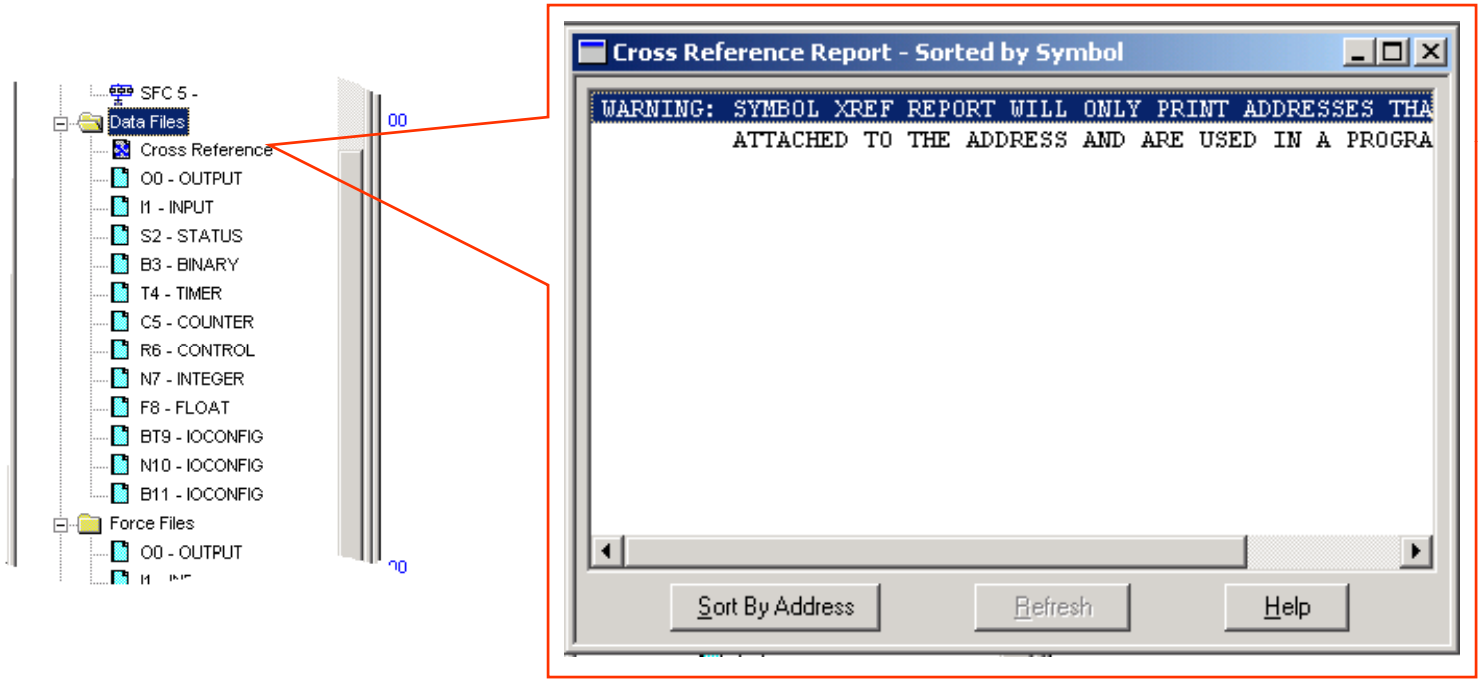
Data Files



- **Cross Reference**
- **O0 – Output**
- **I1 – Input**
- **S2 – Status**
- **B3 – Binary**
- **T4 – Timer**
- **C5 – Counter**
- **R6 – Control**
- **N7 – Integer**
- **F8 – Float**
- **BT9 – IOCONFIG**
- **N10 – IOCONFIG**
- **B11 – IOCONFIG**

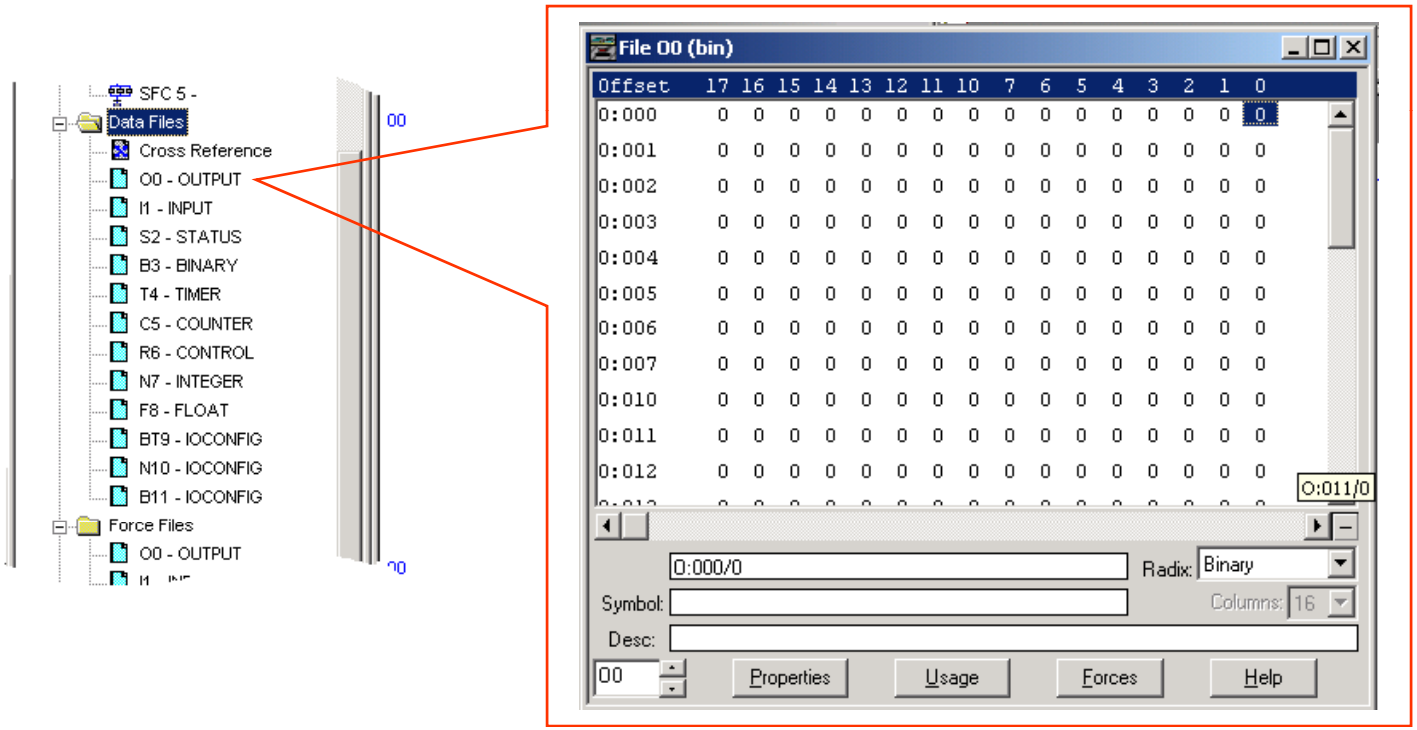
Cross Reference

- Cross Reference menampilkan semua data alamat logik (Logical Adresses) yang dipakai dalam project ini



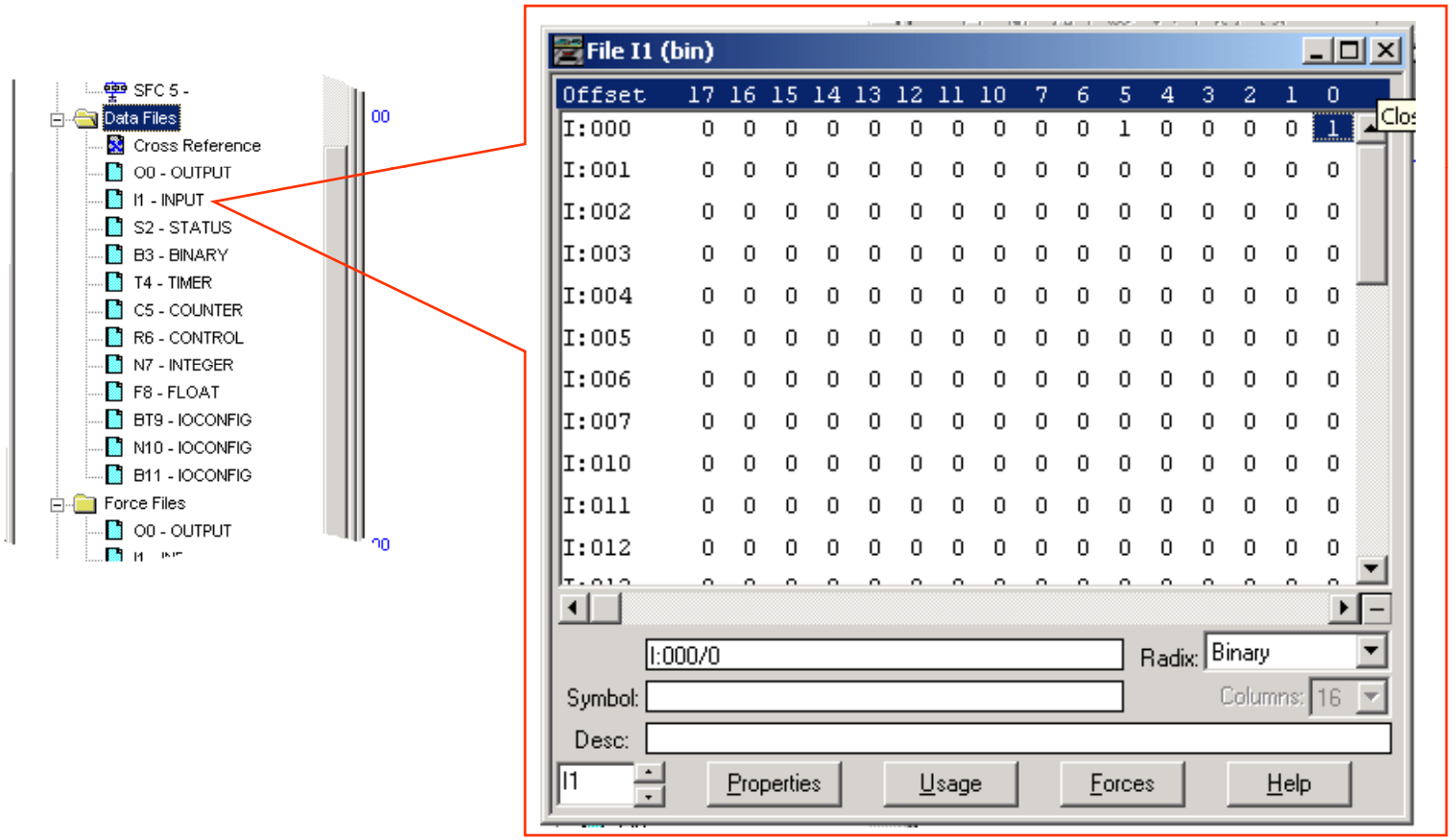
O0 – Output

- O0 – Output menampilkan semua data alamat logik Output (Logical Output Adresses) yang dipakai dalam project ini



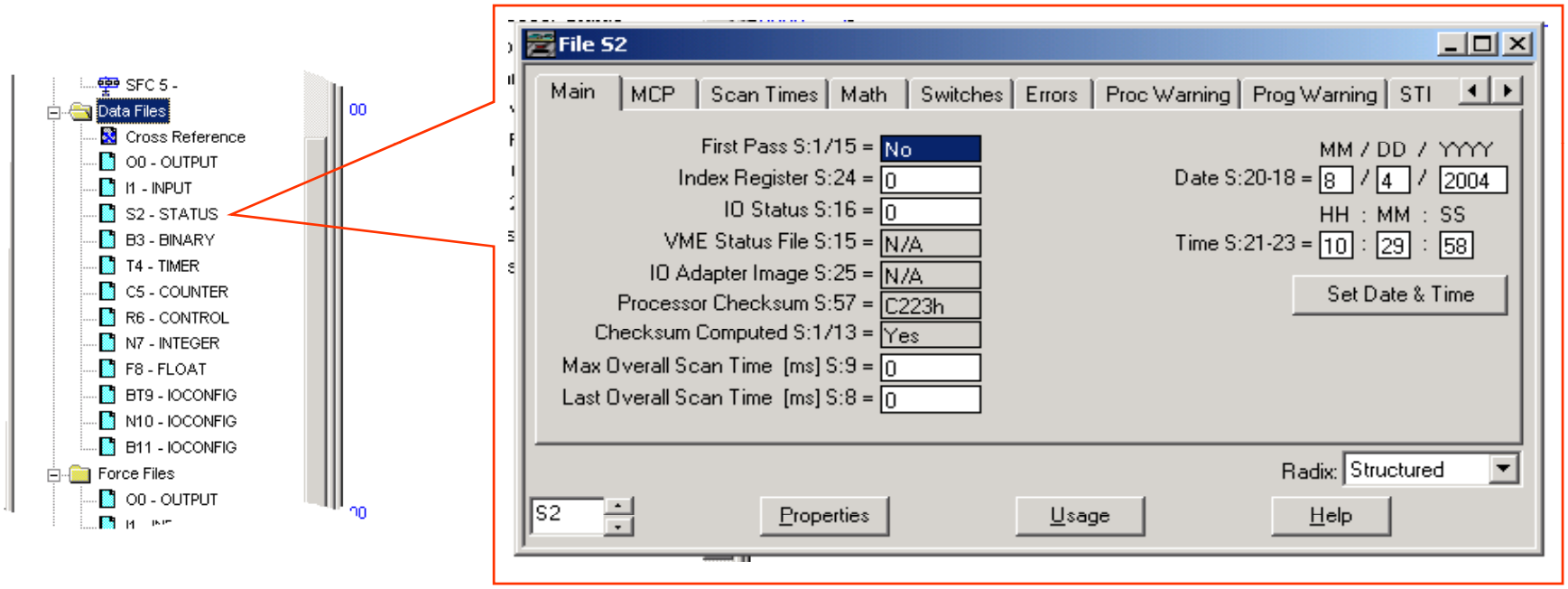
I1 – Input

- I1 – Intput menampilkan semua data alamat logik Input (Logical Input Adresses) yang dipakai dalam project ini



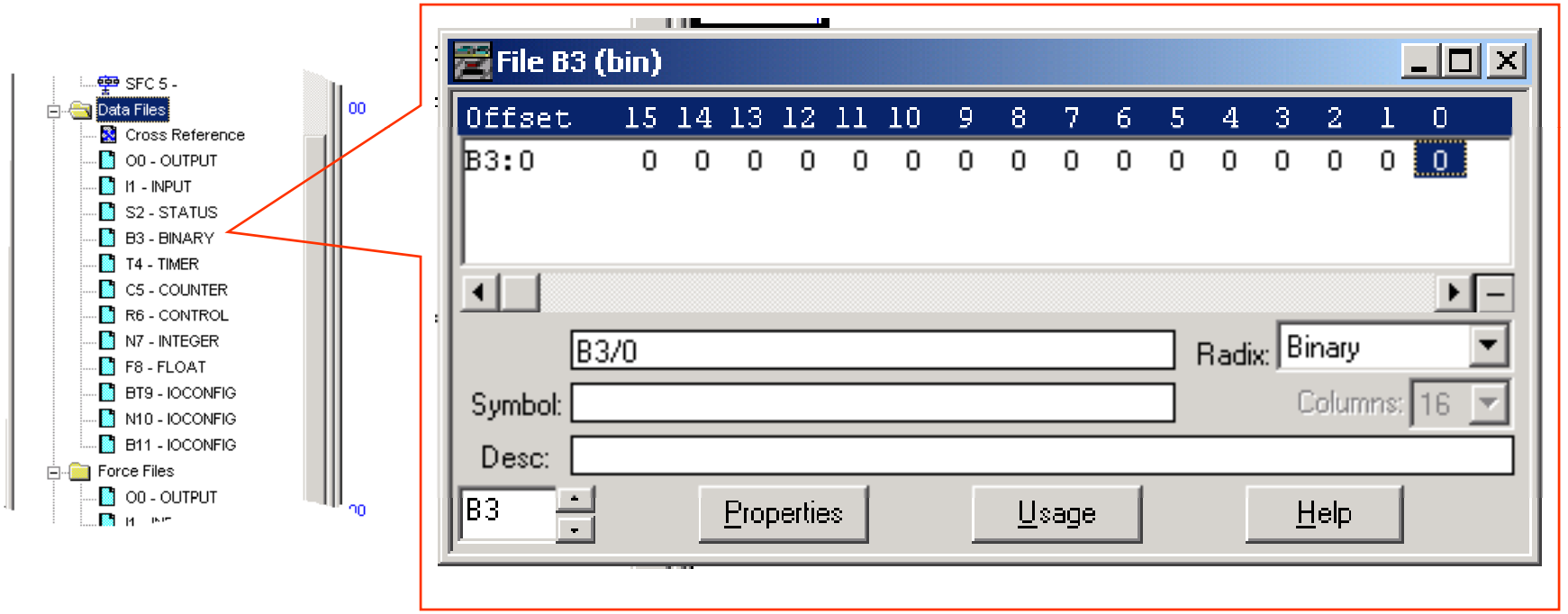
S2 – Status

- S2 – Status, file untuk memonitor pemakaian alamat status (Status Address) yang digunakan dalam project



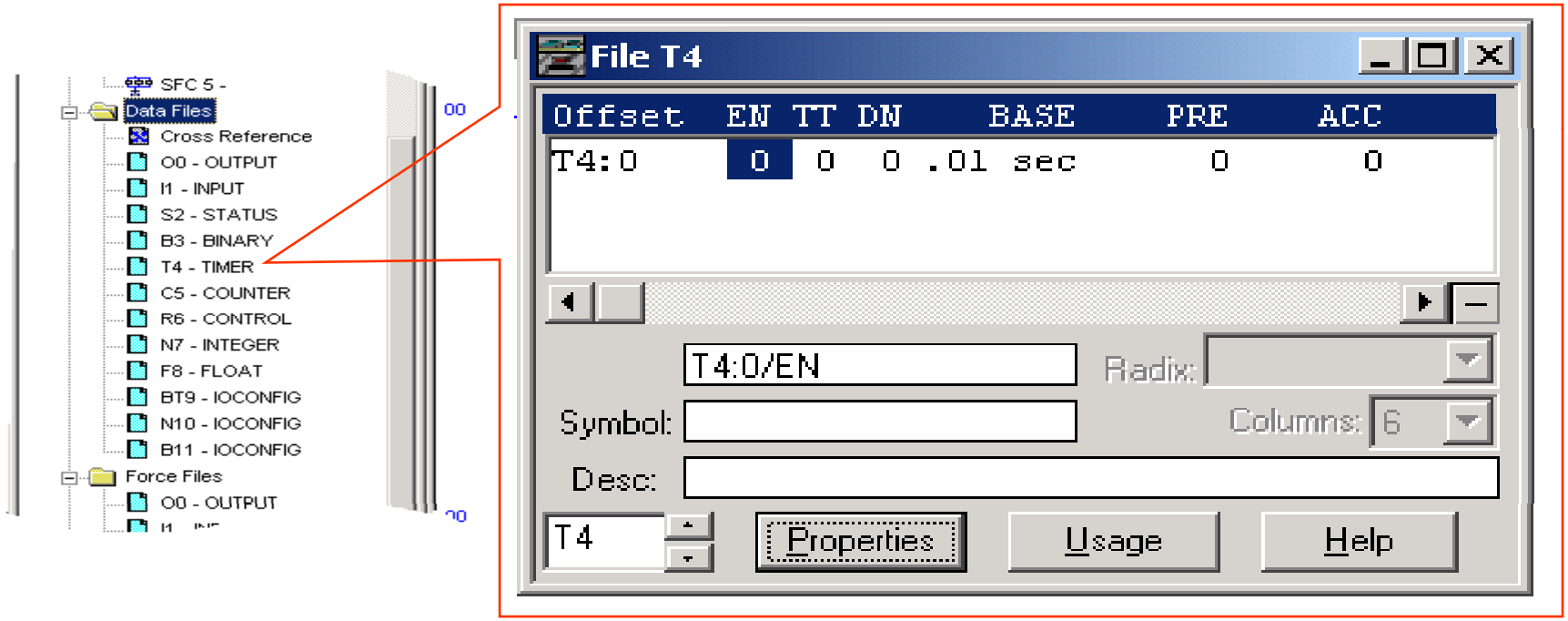
B3 - Binary

- B3 – Binary digunakan untuk memonitor pemakaian alamat Biner B3 pada project



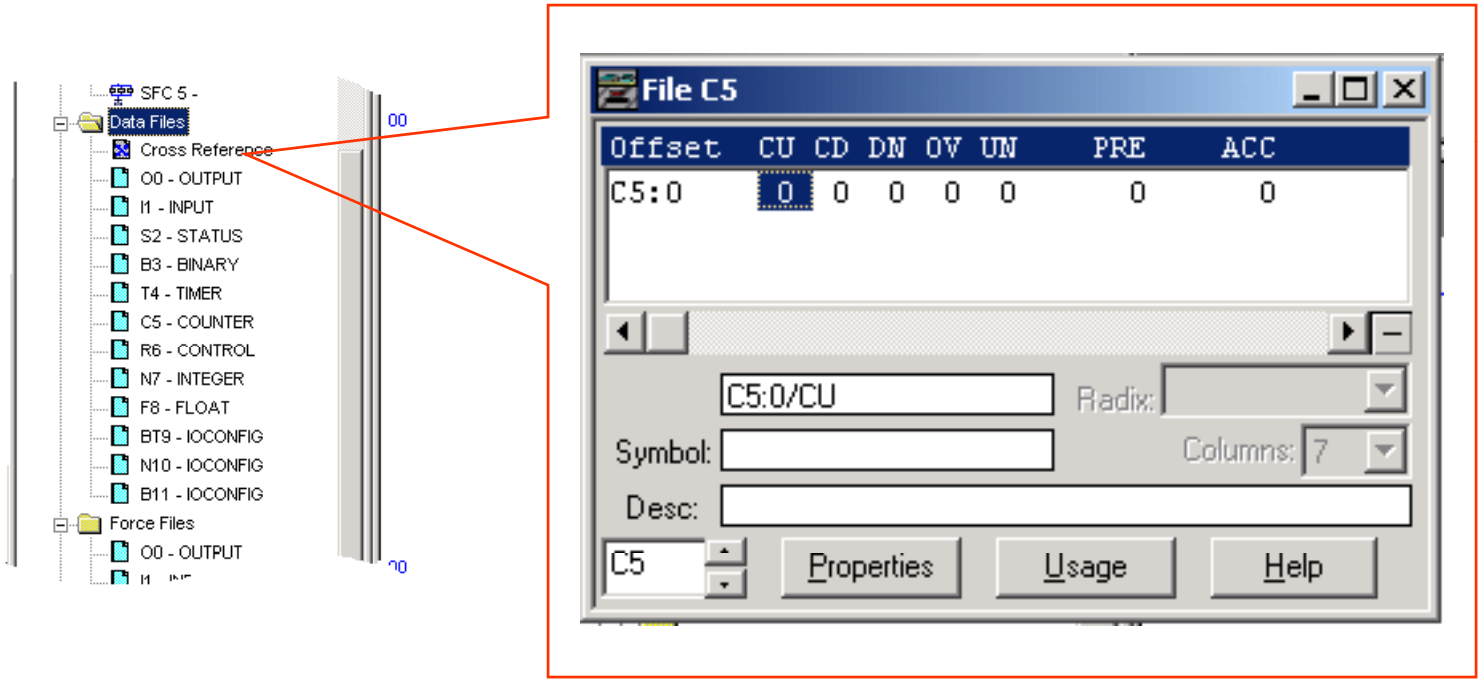
T4 – Timer

- T4 – Timer, digunakan untuk memonitor pemakaian alamat Timer T4 pada project



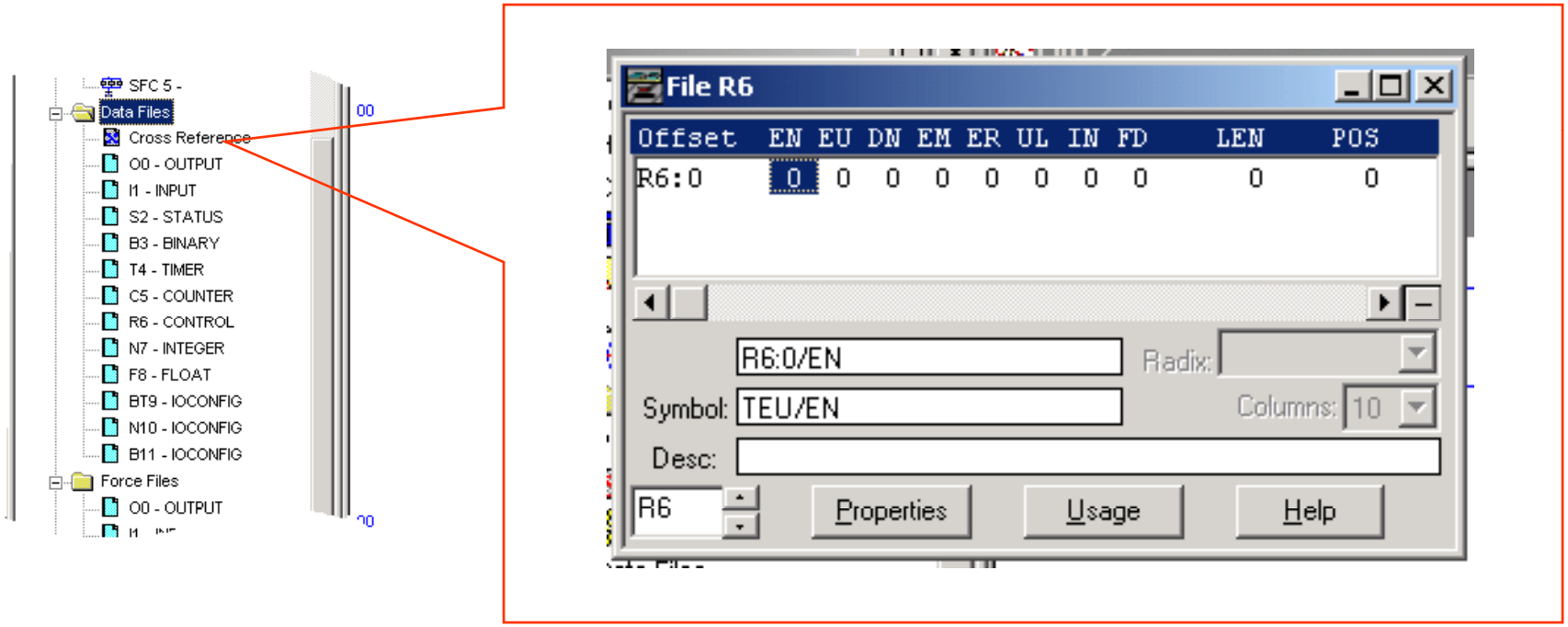
C5 – Counter

- C5 – Counter, digunakan untuk memonitor penggunaan alamat C5 – Counter pada project



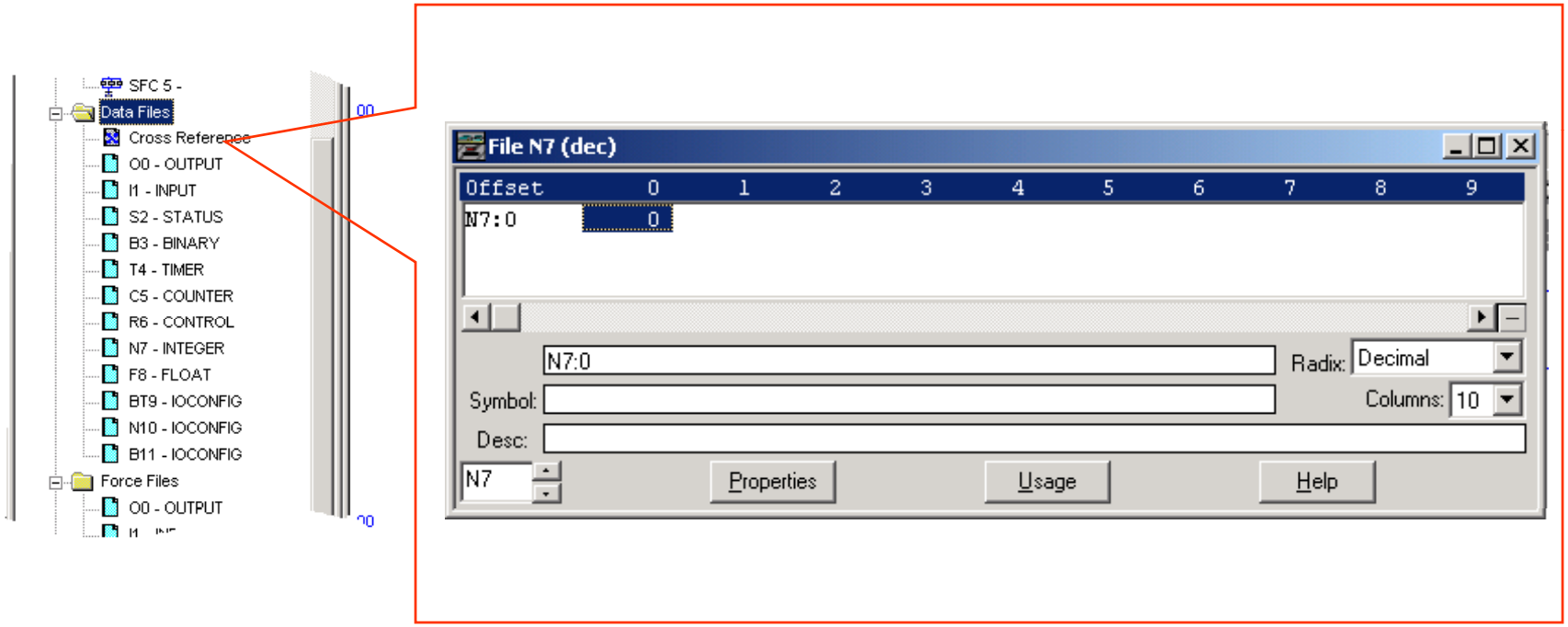
R6 - Control

- R6 – Control, digunakan untuk memonitor penggunaan alamat R6 – Control pada project

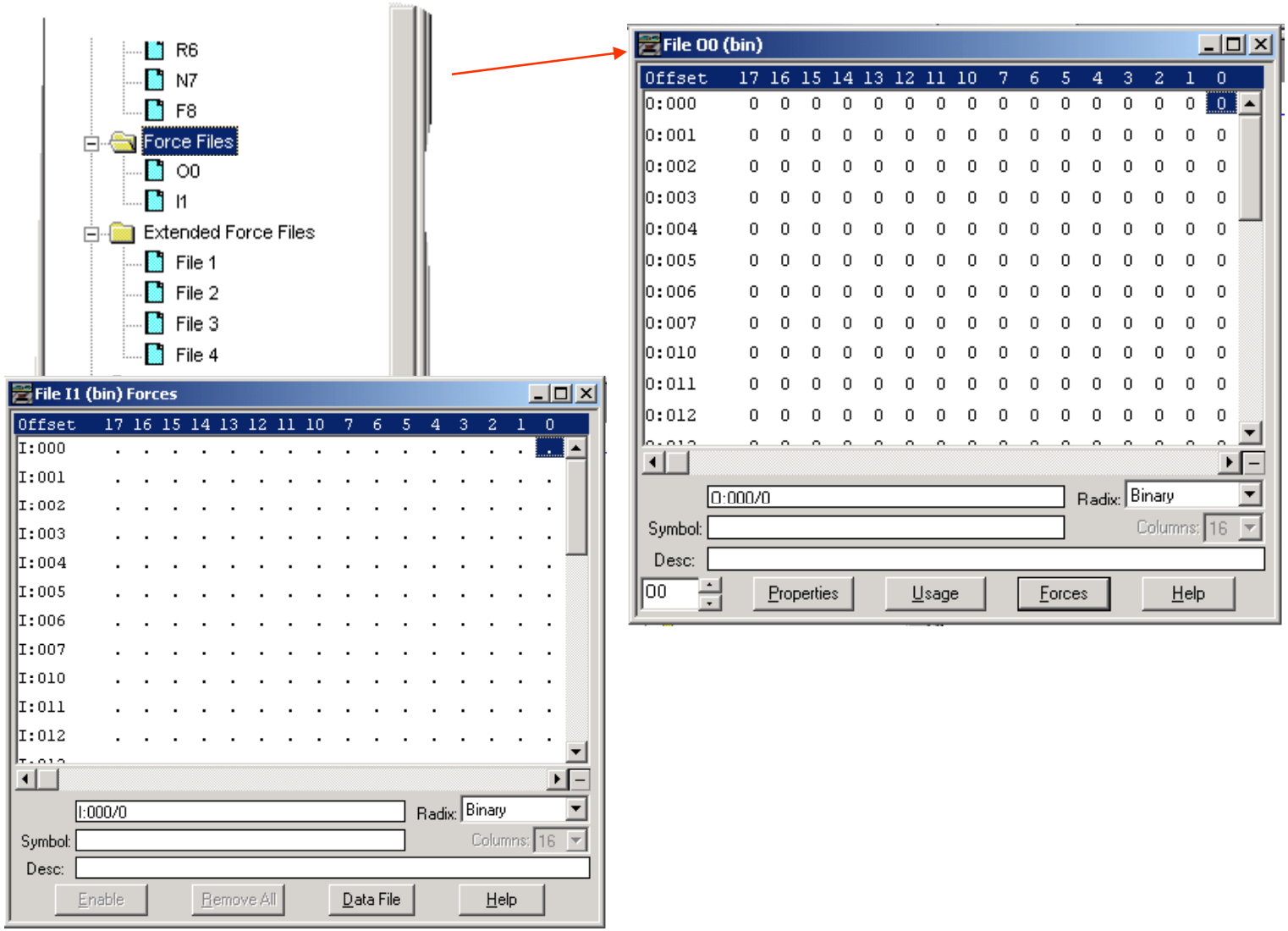


N7 – Integer

- N7 – Integer, digunakan untuk memonitor penggunaan alamat N7 – Integer pada project

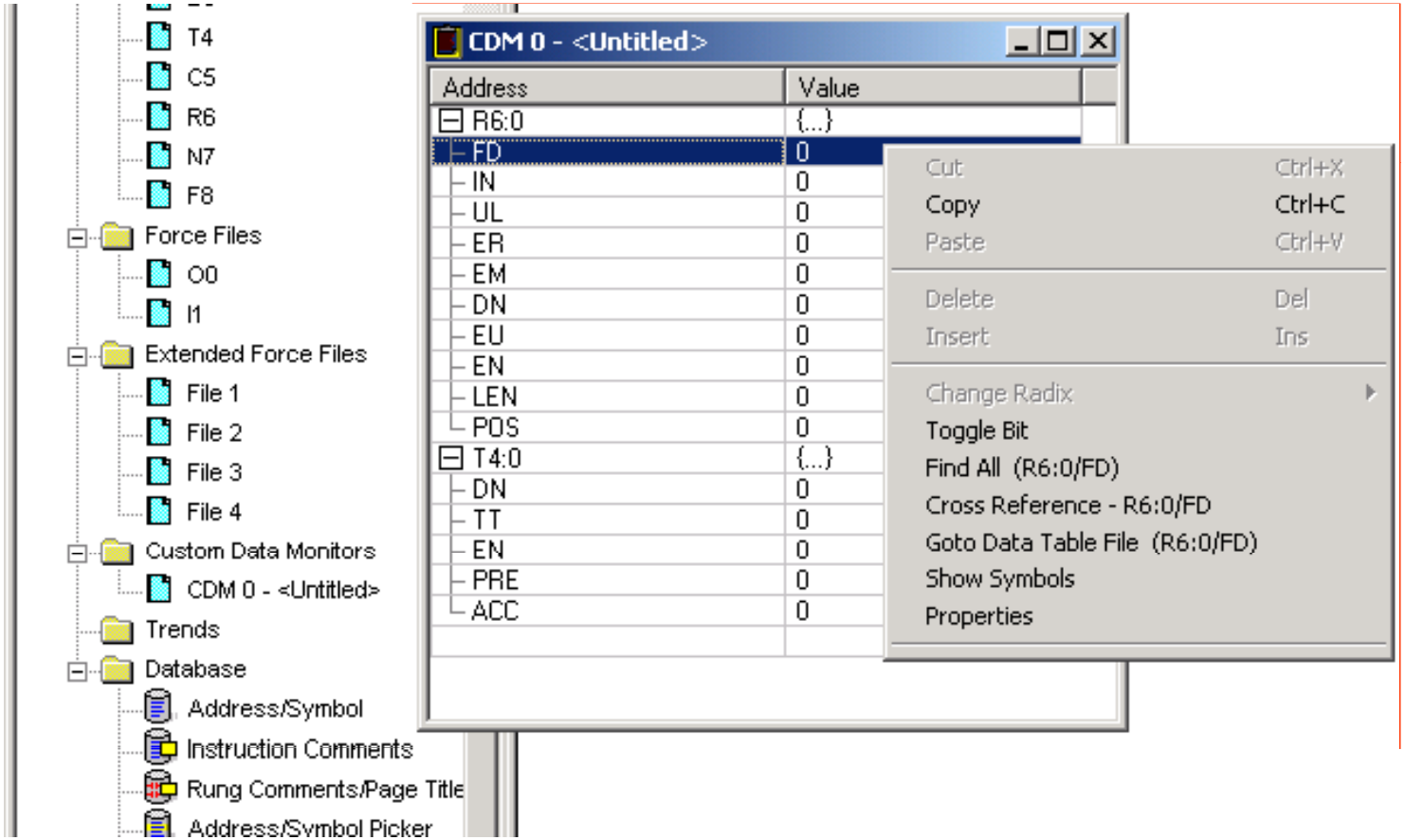


Force File


R6
N7
F8
Force Files
O0
I1
Extended Force Files
File 1
File 2
File 3
File 4
File I1 (bin) Forces
Offset 17 16 15 14 13 12 11 10 7 6 5 4 3 2 1 0
I:000
I:001
I:002
I:003
I:004
I:005
I:006
I:007
I:010
I:011
I:012
I:000/0
Radix: Binary
Symbol:
Columns: 16
Desc:
Enable
Remove All
Data File
Help
File O0 (bin)
Offset 17 16 15 14 13 12 11 10 7 6 5 4 3 2 1 0
0:000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:001 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:002 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:003 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:004 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:005 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:006 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:007 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:010 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:011 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:012 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0:000/0
Radix: Binary
Symbol:
Columns: 16
Desc:
O0
Properties
Usage
Forces
Help

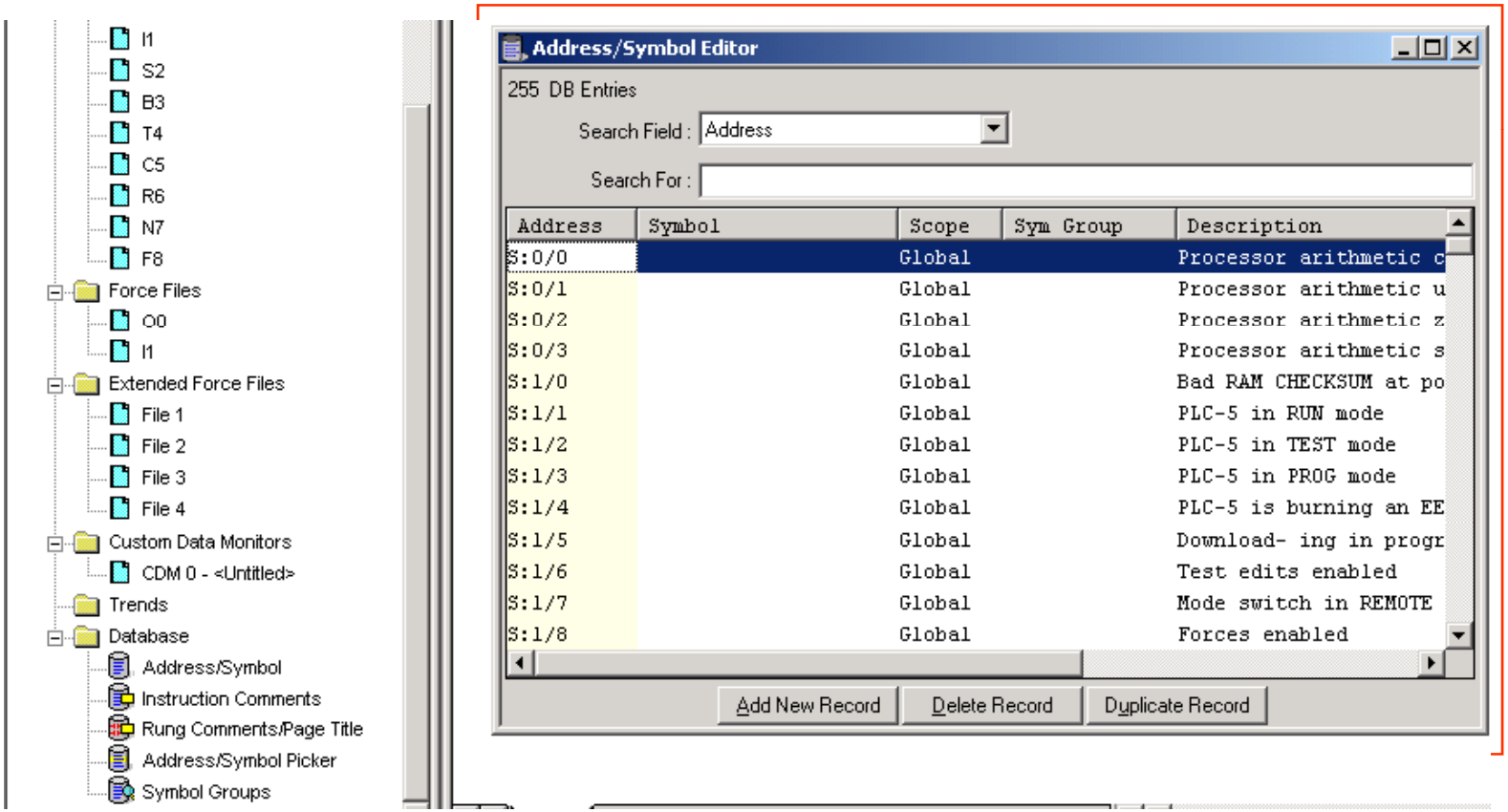
Custom Data Monitor

- CDM – dapat memonitor alamat yang digunakan dalam project, tetapi dapat dikostumisasi

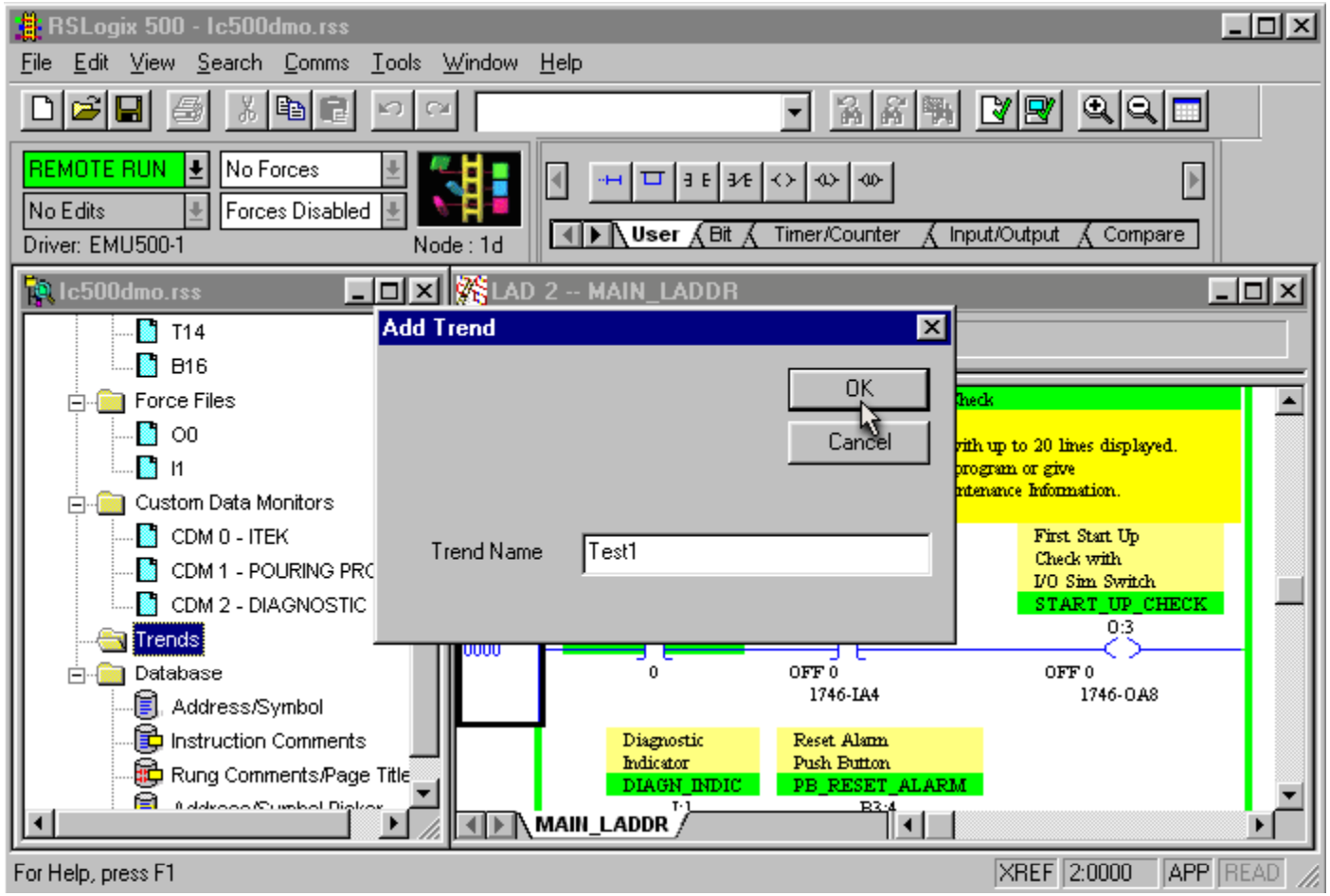


Database

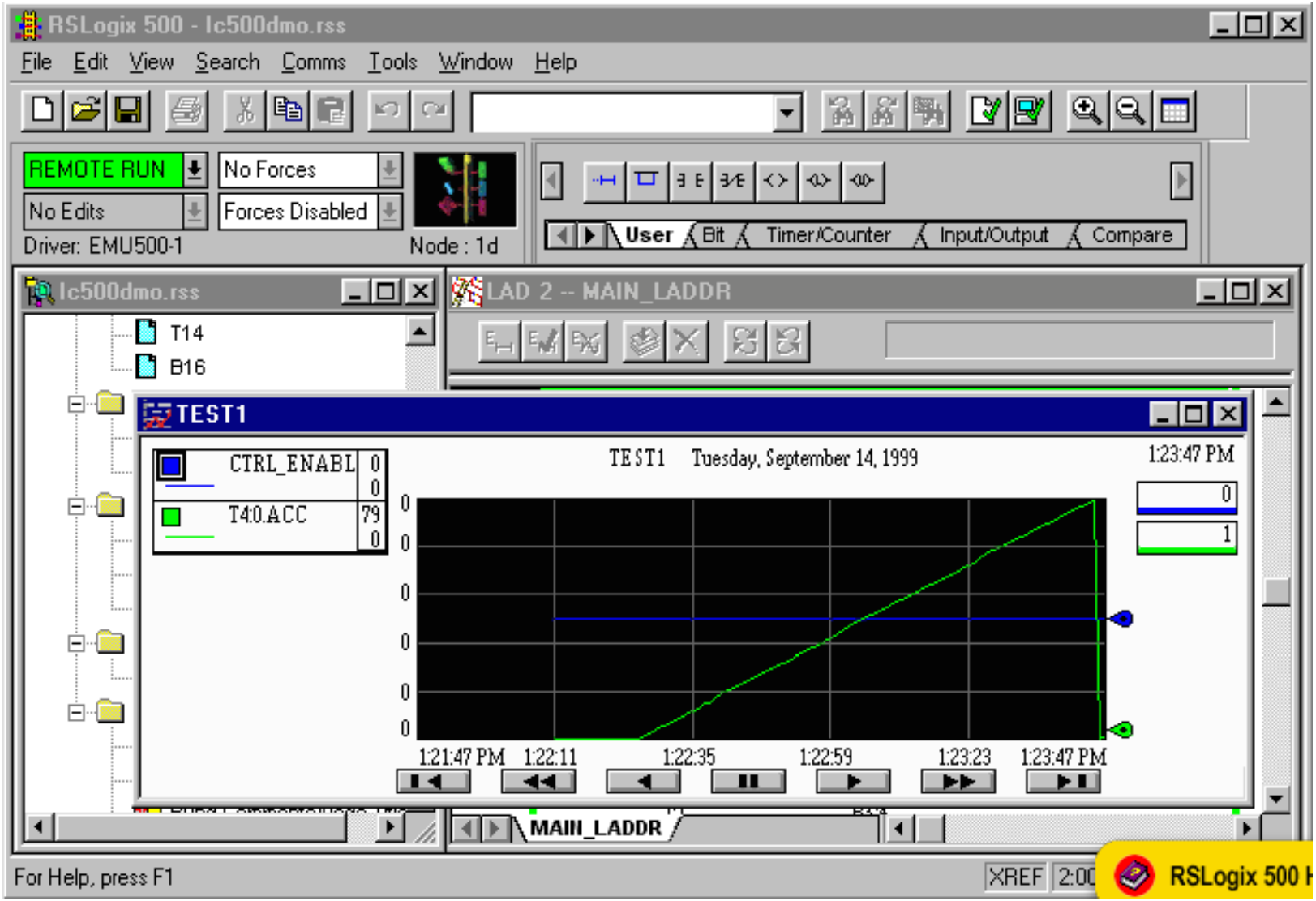
- Database menyimpan semua alamat yang digunakan dalam project, dapat diedit sesuai dengan keperluan dan juga didrag and drop pada program ladder-nya



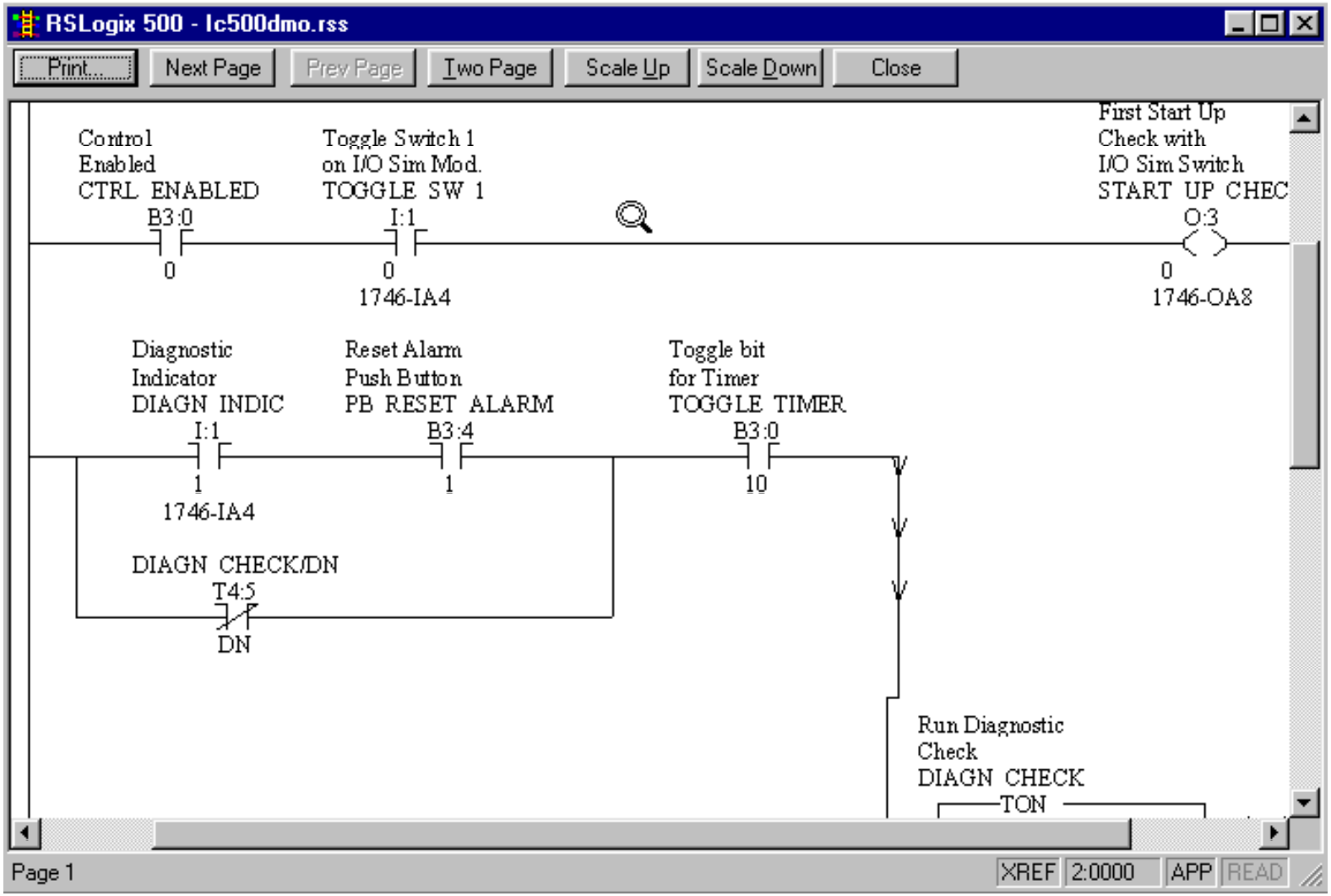
Trend Monitoring (1)



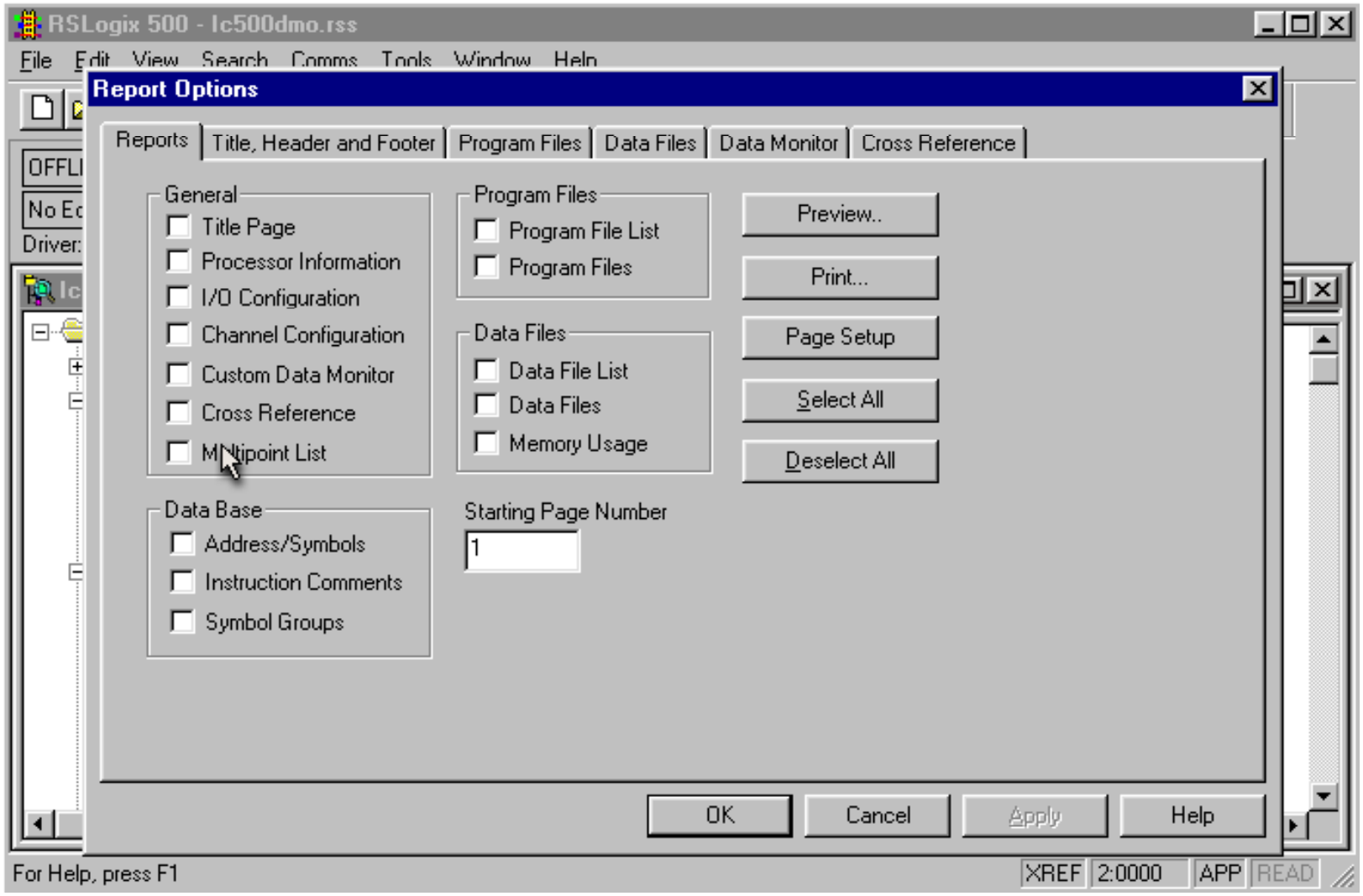
Trend Monitoring (2)



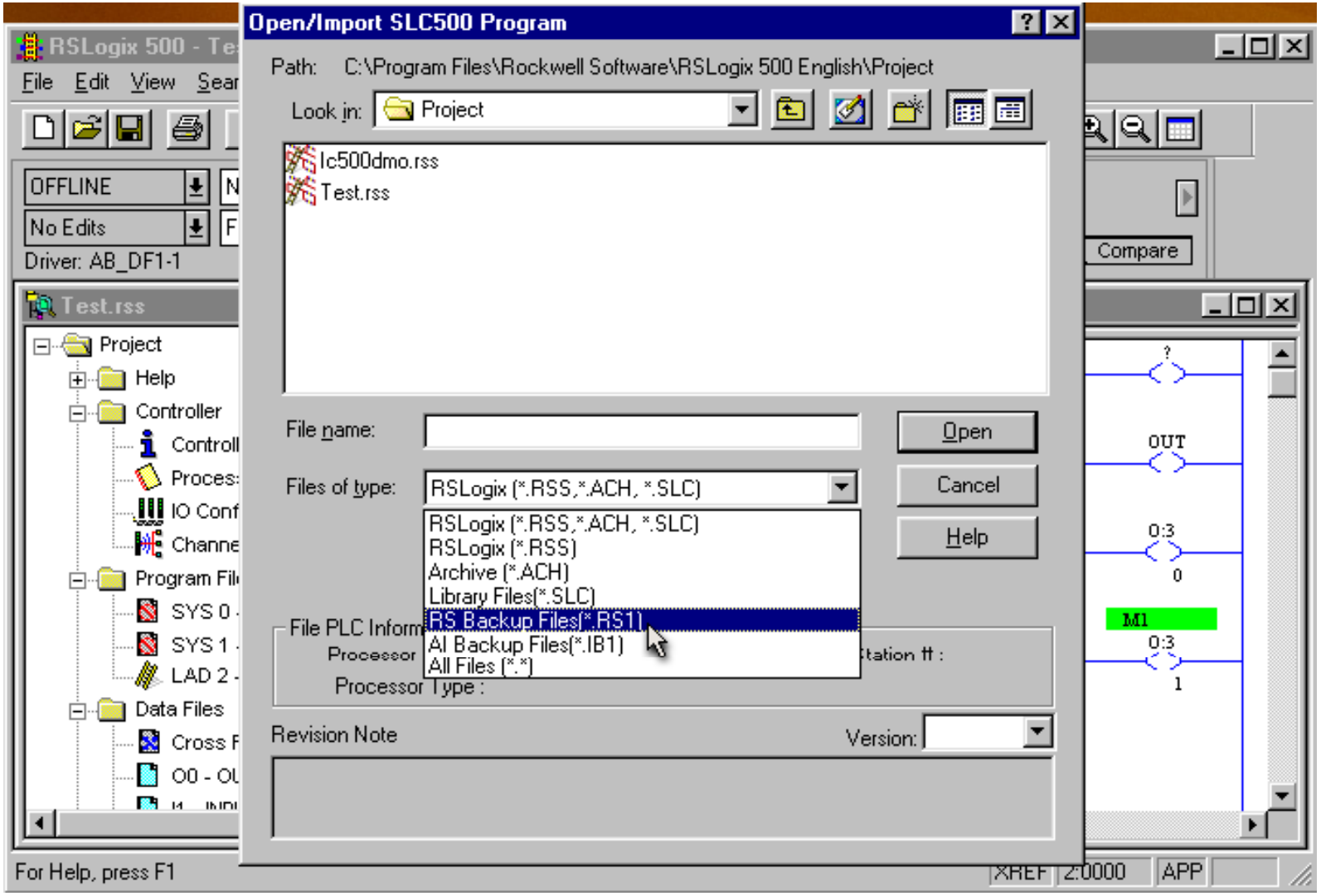
Reporting Preview



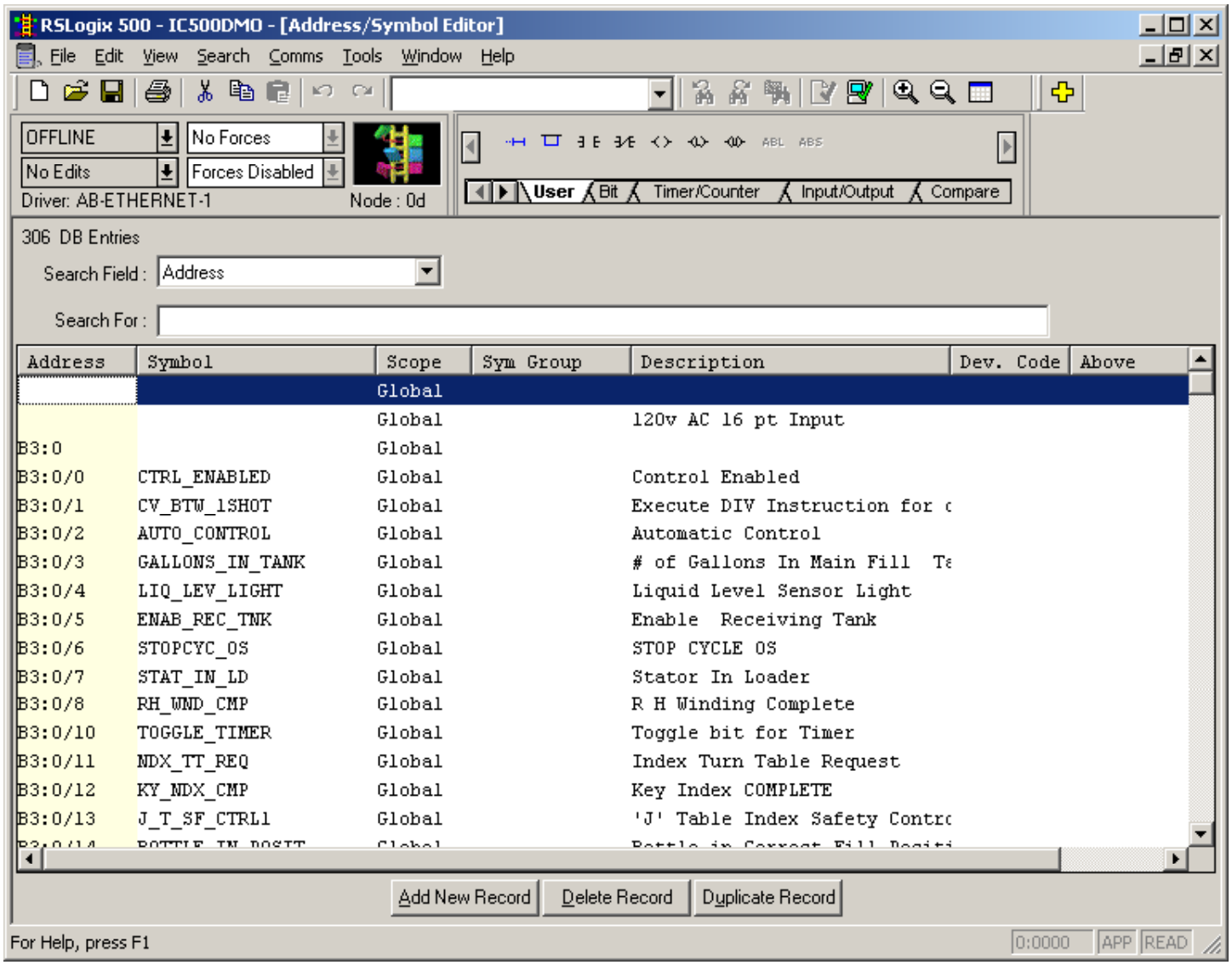
Report Option



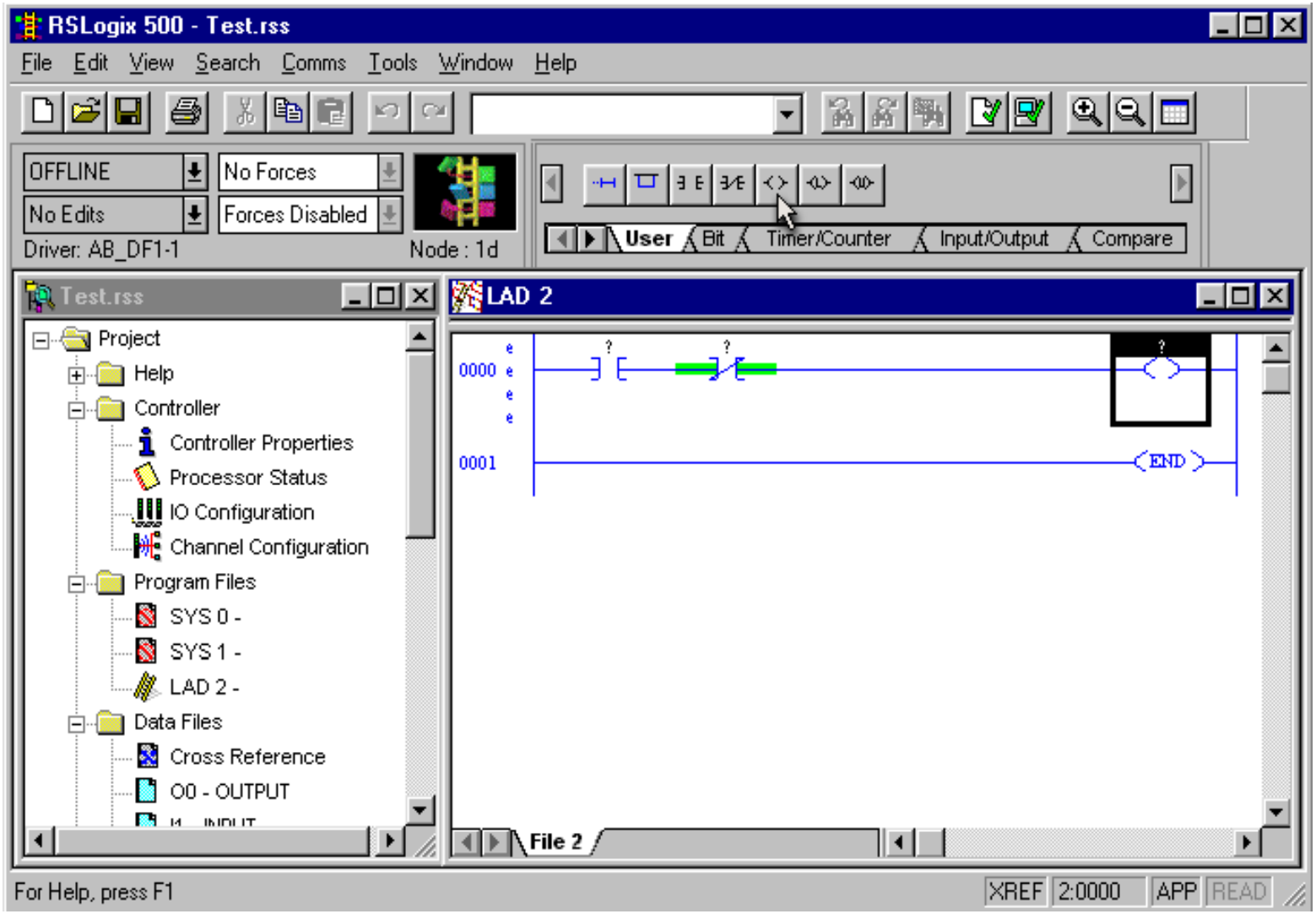
Backup File


Open/Import SLC500 Program
Path: C:\Program Files\Rockwell Software\RSLogix 500 English\Project
Look in: Project
lc500dmo.rss
Test.rss
File name:
Open
Files of type: RSLogix (*.RSS,*.ACH, *.SLC)
Cancel
Help
RSLogix (*.RSS,*.ACH, *.SLC)
RSLogix (*.RSS)
Archive (*.ACH)
Library Files(*.SLC)
RS Backup Files(*.RS1)
AI Backup Files(*.IB1)
All Files (*.*)
File PLC Inform
Processor
Processor Type :
Revision Note
Version:
RSLogix 500 - Te
File Edit View Sear
OFFLINE
No Edits
Driver: AB_DF1-1
Test.rss
Project
Help
Controller
Program Fil
Data Files
Compare
OUT
0:3
0
M1
0:3
1
For Help, press F1
XREF
APP

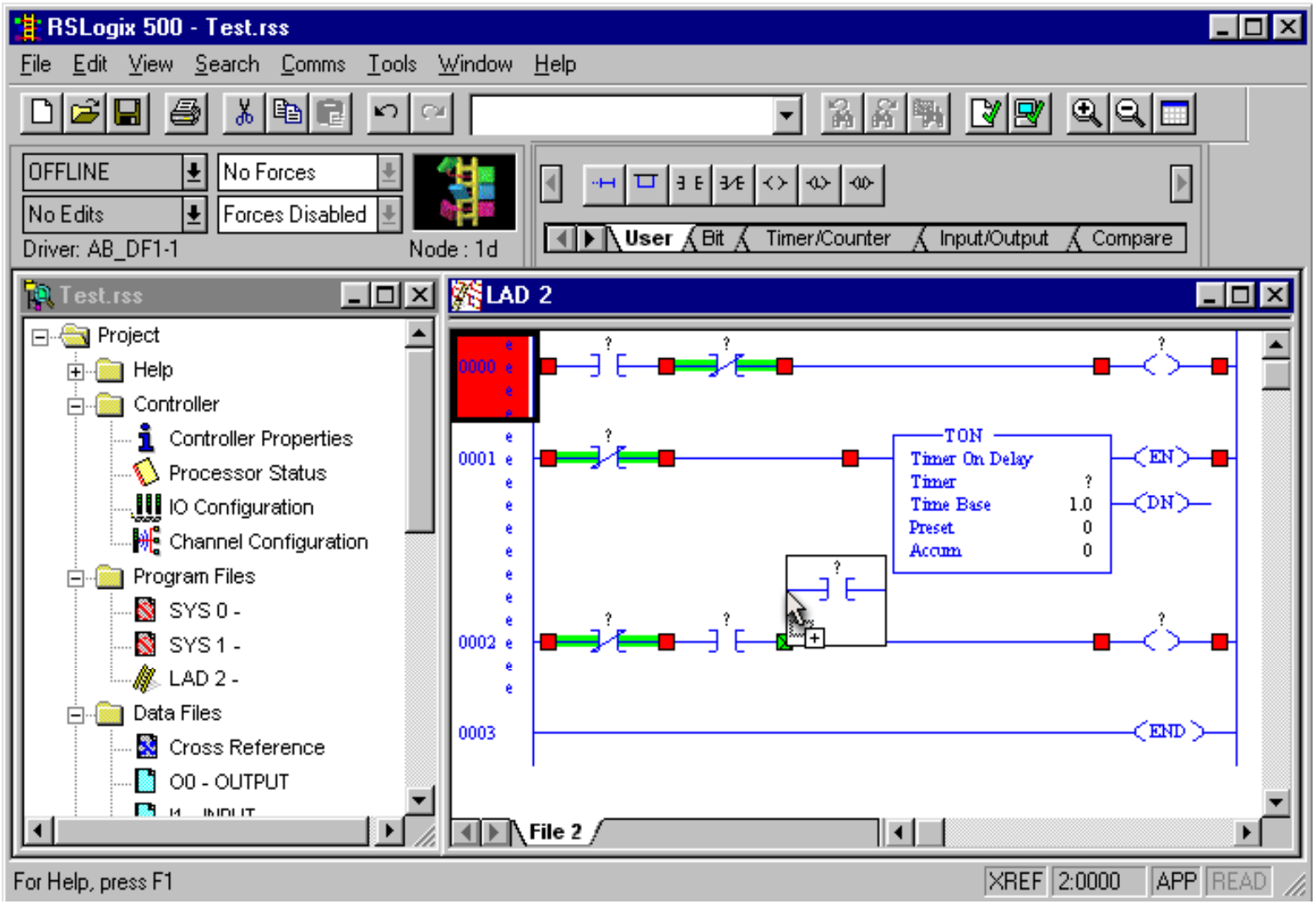
Address/Symbol Editor



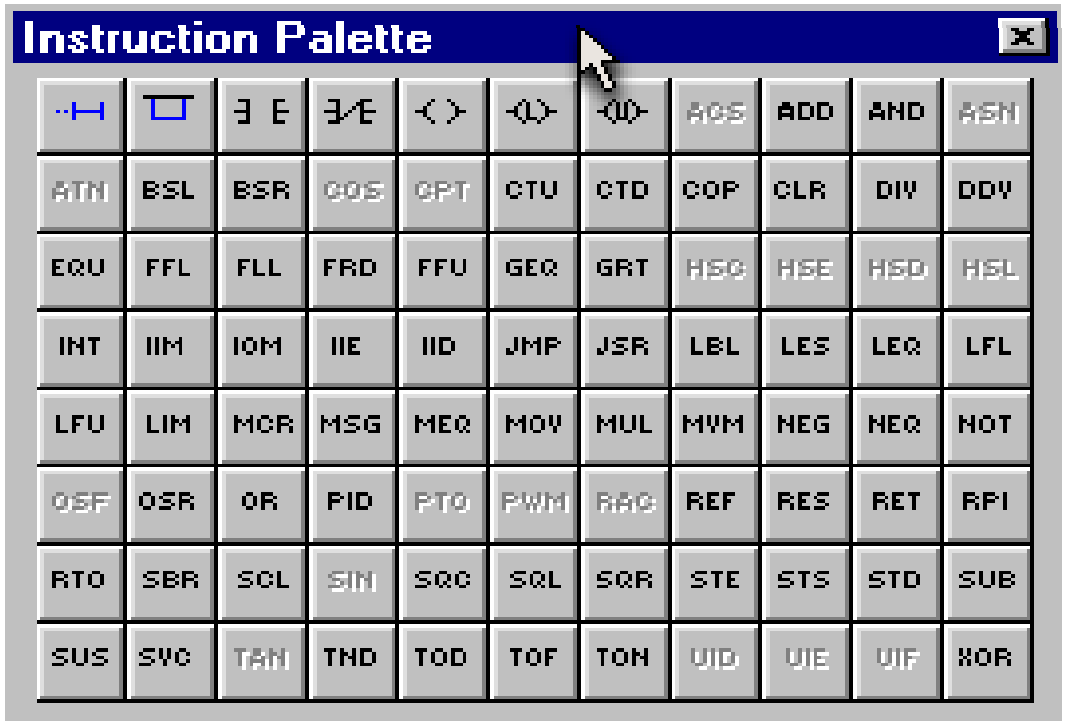
Ladder Logic Editing



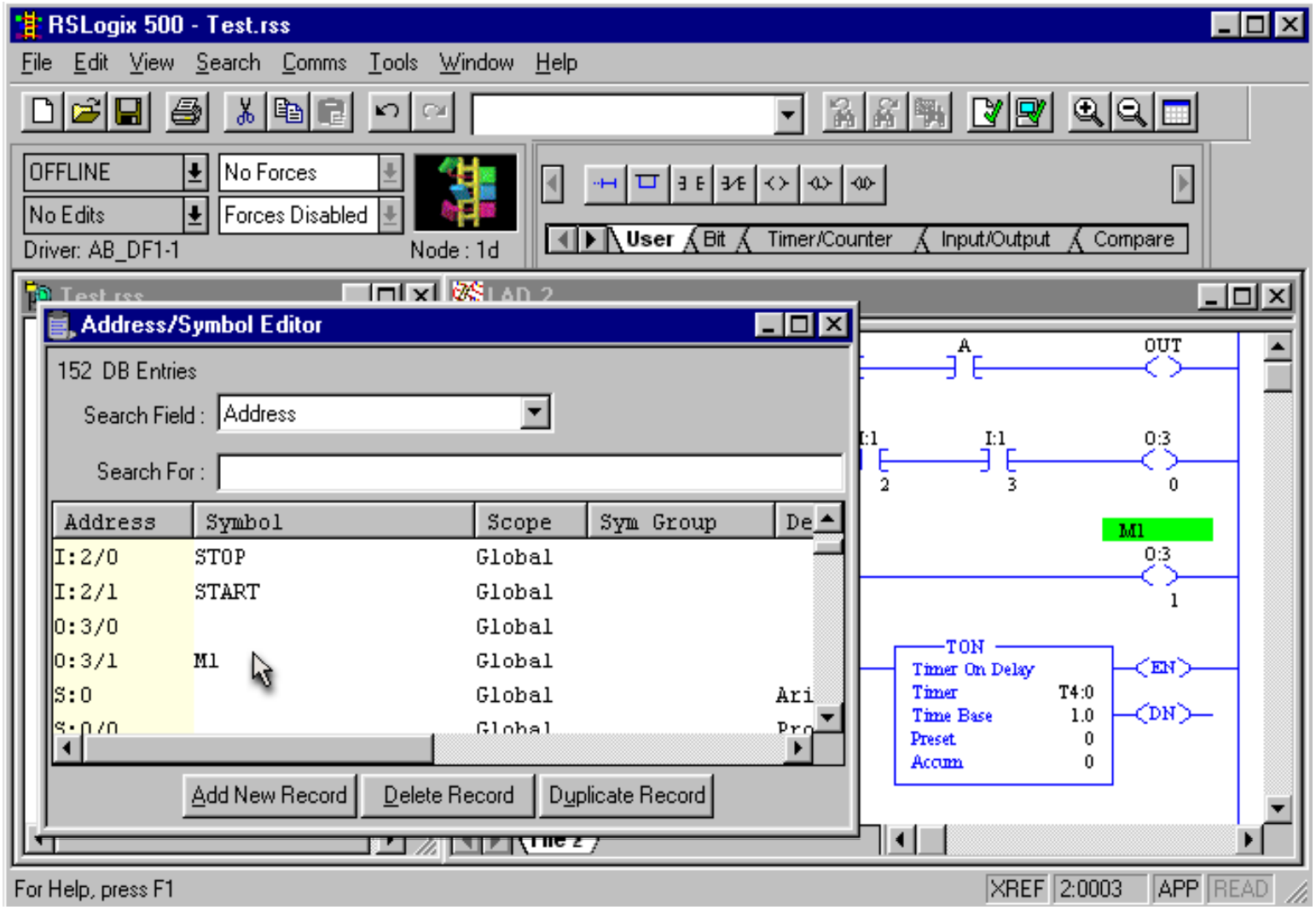
Ladder Logic Editing



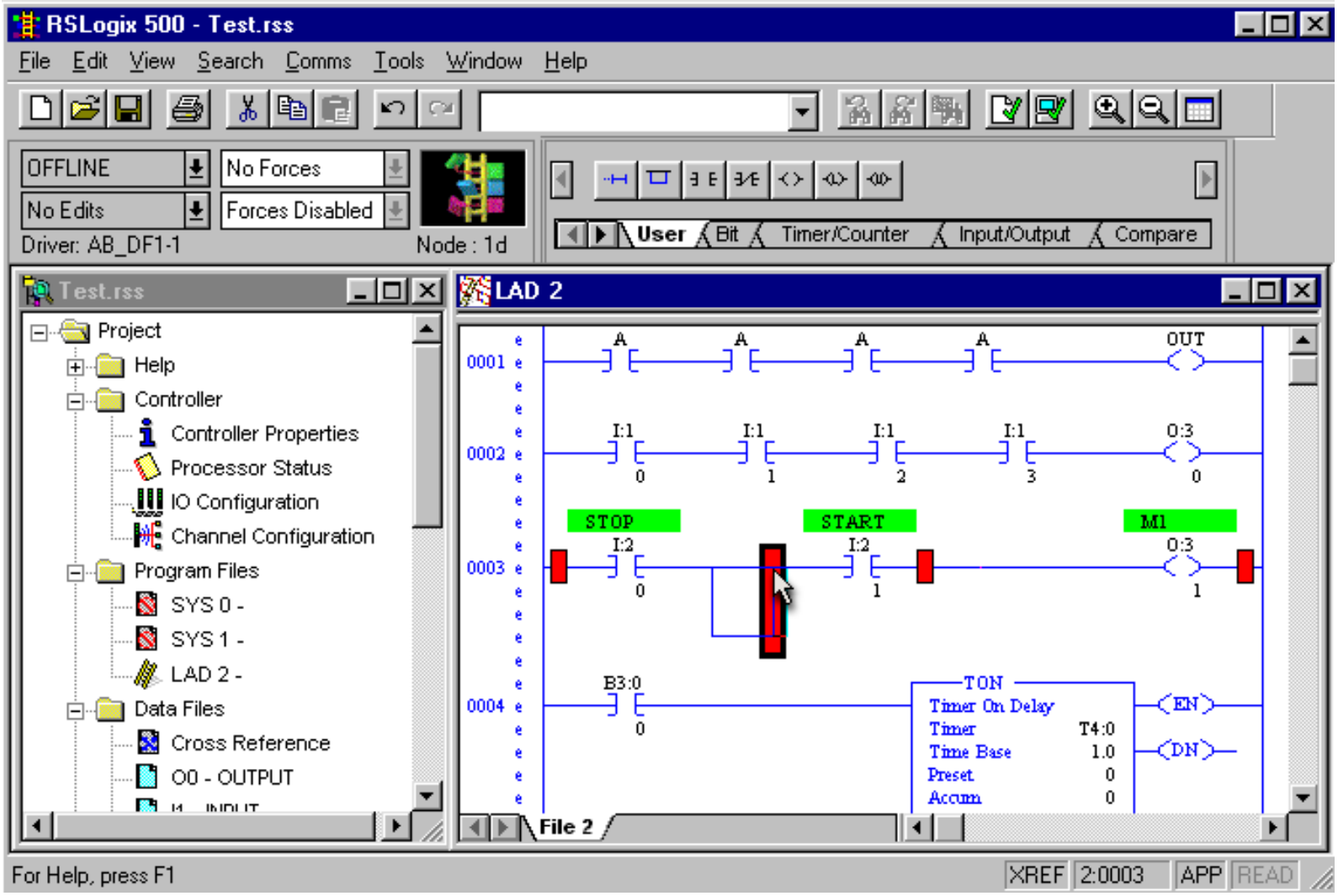
Instruction Palette



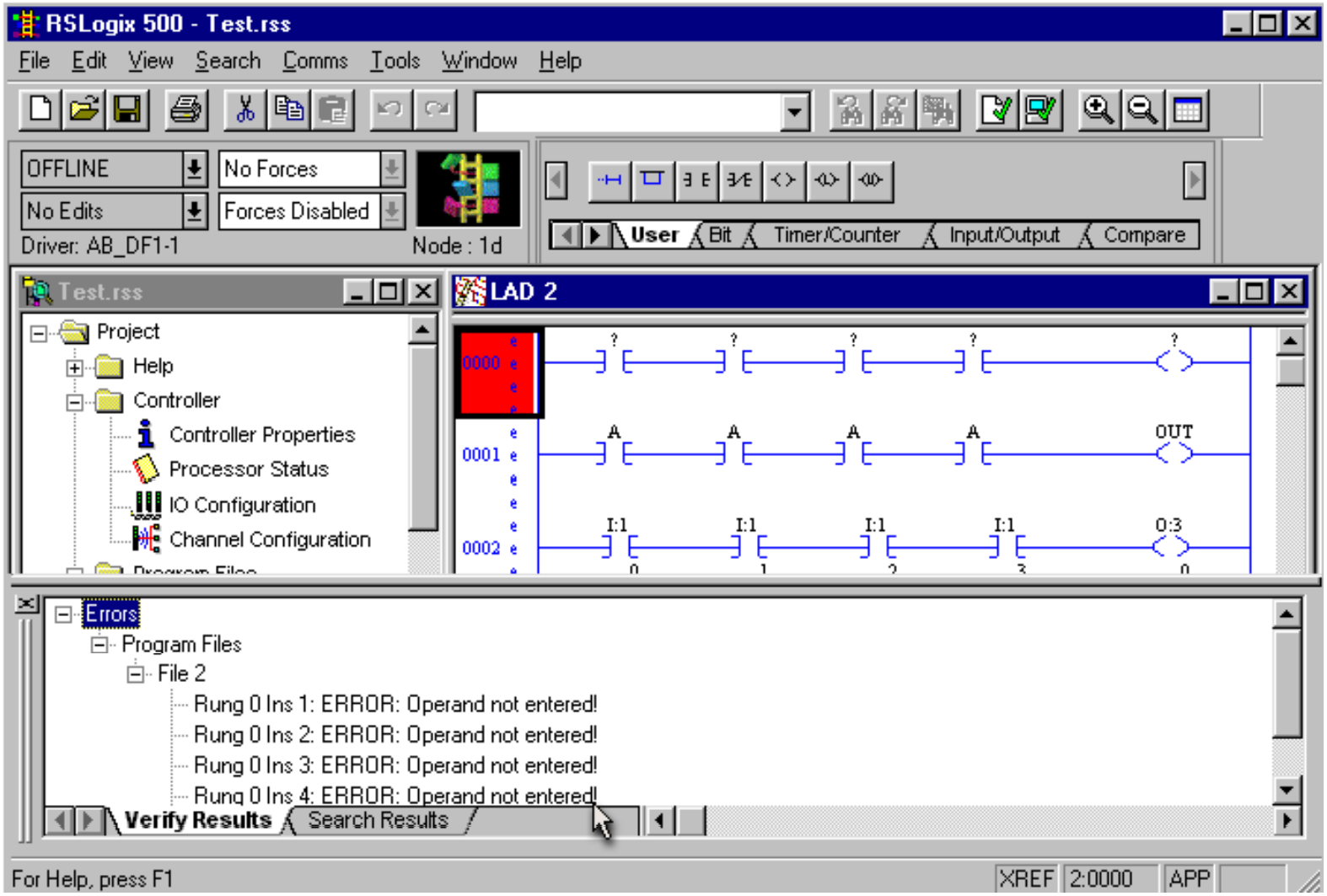
Symbols


RSLogix 500 - Test.rss
File Edit View Search Comms Tools Window Help
OFFLINE
No Forces
No Edits
Forces Disabled
Driver: AB_DF1-1
Node : 1d
User Bit Timer/Counter Input/Output Compare
Address/Symbol Editor
152 DB Entries
Search Field : Address
Search For :
Address Symbol Scope Sym Group
I:2/0 STOP Global
I:2/1 START Global
O:3/0 Global
O:3/1 M1 Global
S:0 Global
Add New Record
Delete Record
Duplicate Record
A
OUT
I:1
2
I:1
3
O:3
0
M1
O:3
1
TON
Timer On Delay
Timer T4:0
Time Base 1.0
Preset 0
Accum 0
EN
DN
For Help, press F1
XREF 2:0003 APP READ

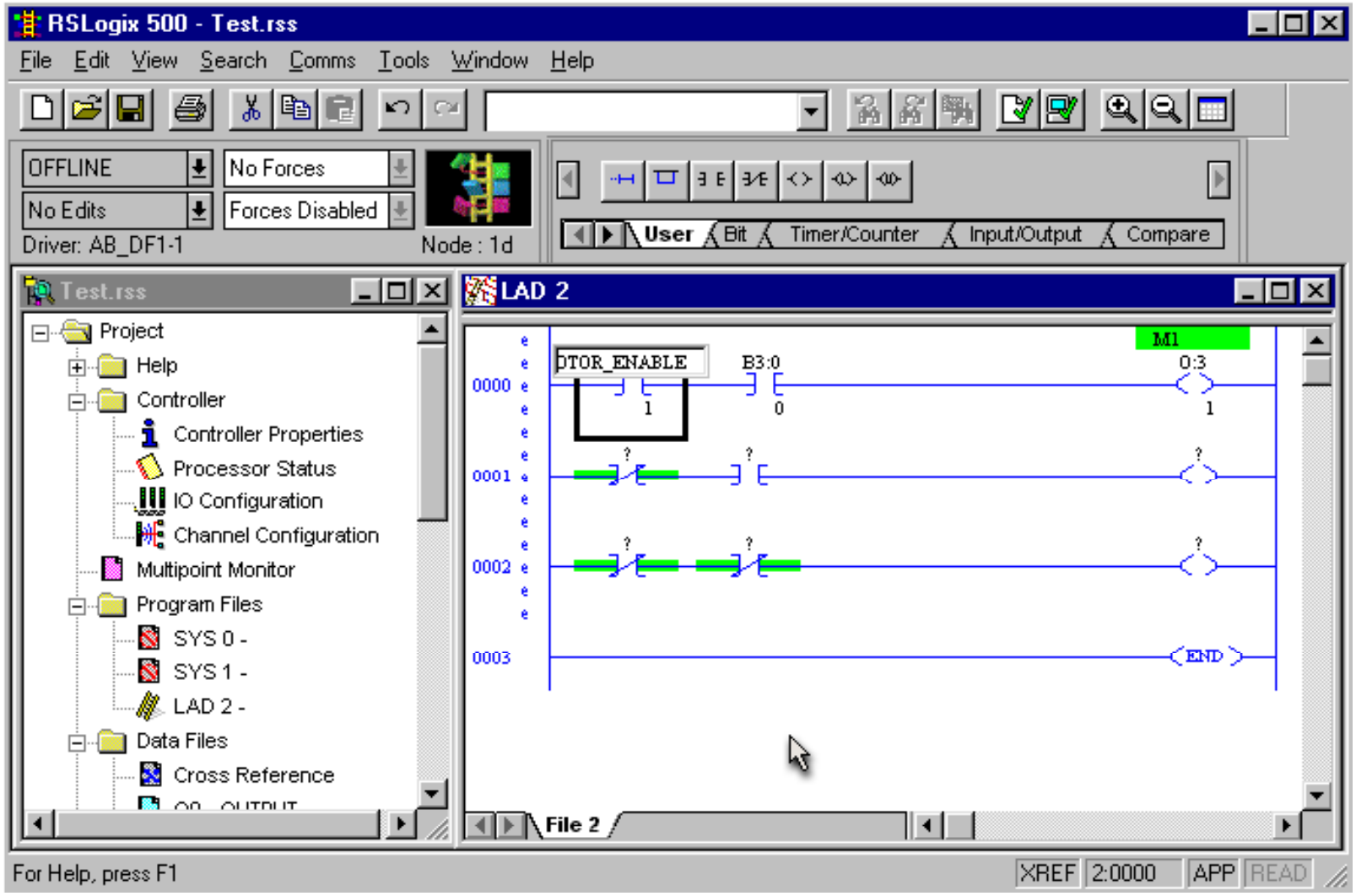
Extended Branch



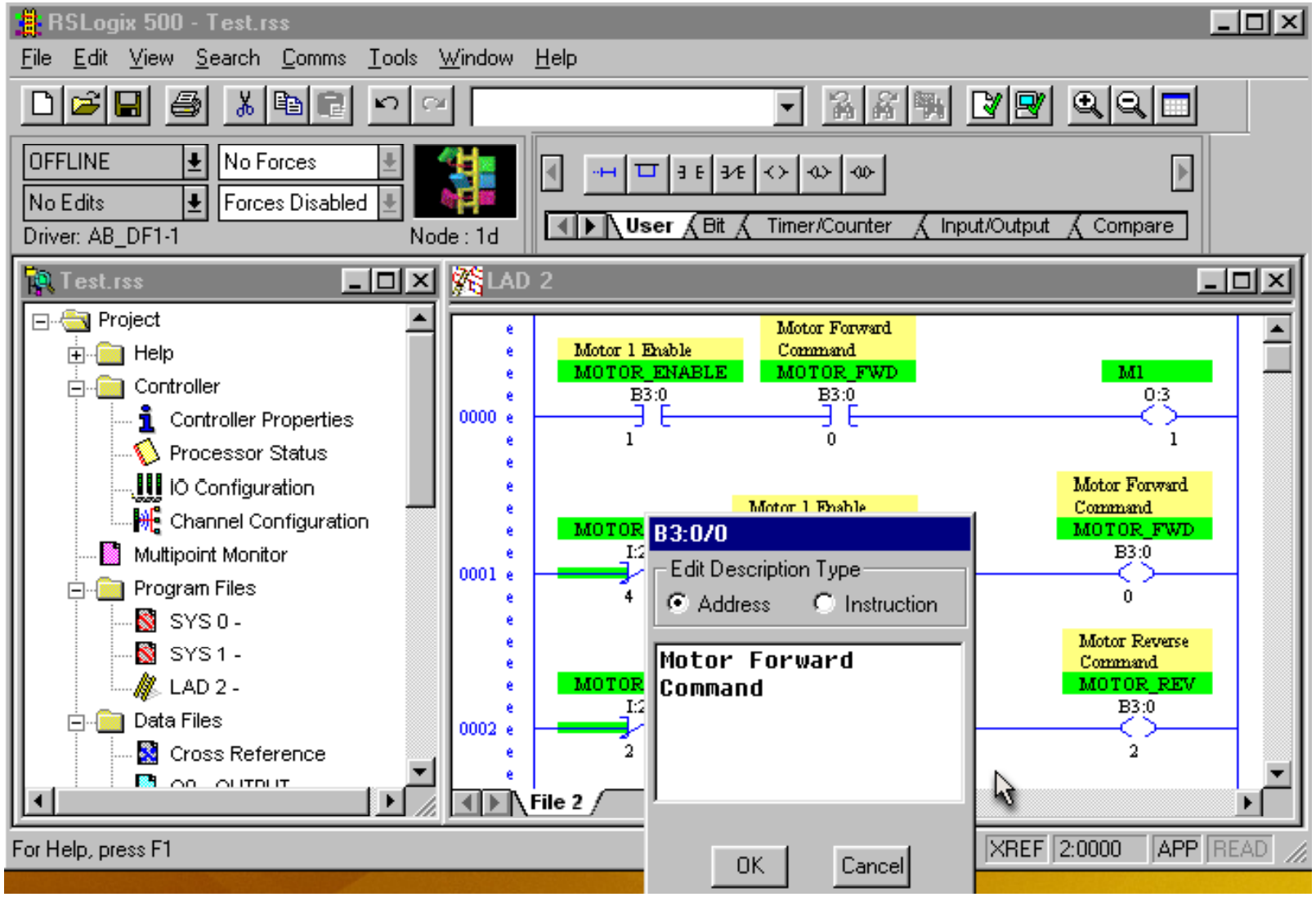
Rung Verification



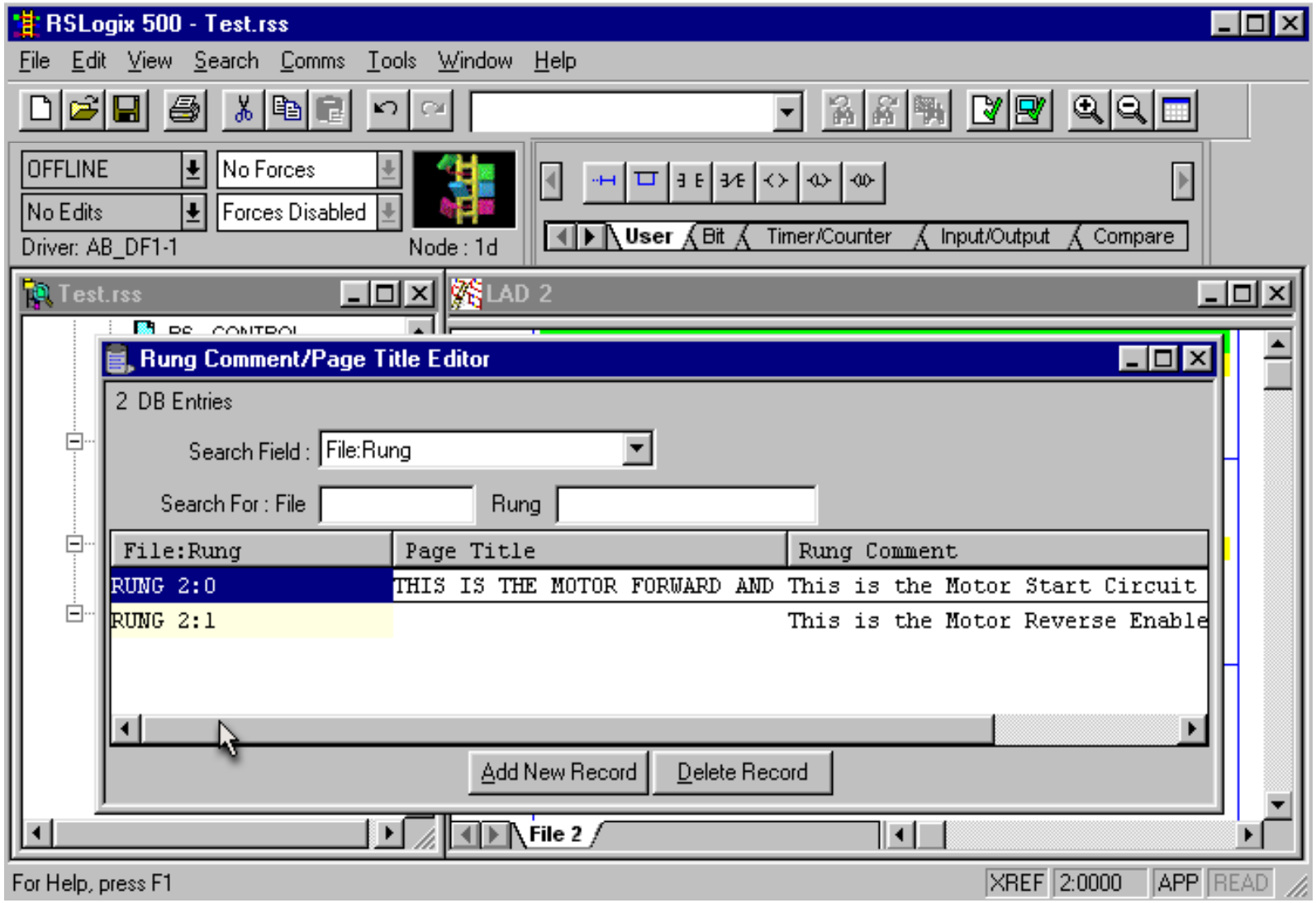
Symbol Edit


RSLogix 500 - Test.rss
File Edit View Search Comms Tools Window Help
OFFLINE
No Forces
No Edits
Forces Disabled
Driver: AB_DF1-1
Node : 1d
User Bit Timer/Counter Input/Output Compare
Test.rss
Project
Help
Controller
Controller Properties
Processor Status
IO Configuration
Channel Configuration
Multipoint Monitor
Program Files
SYS 0 -
SYS 1 -
LAD 2 -
Data Files
Cross Reference
LAD 2
DTOR_ENABLE
B3:0
M1
O:3
0000
0001
0002
0003
END
File 2
For Help, press F1
XREF
2:0000
APP
READ

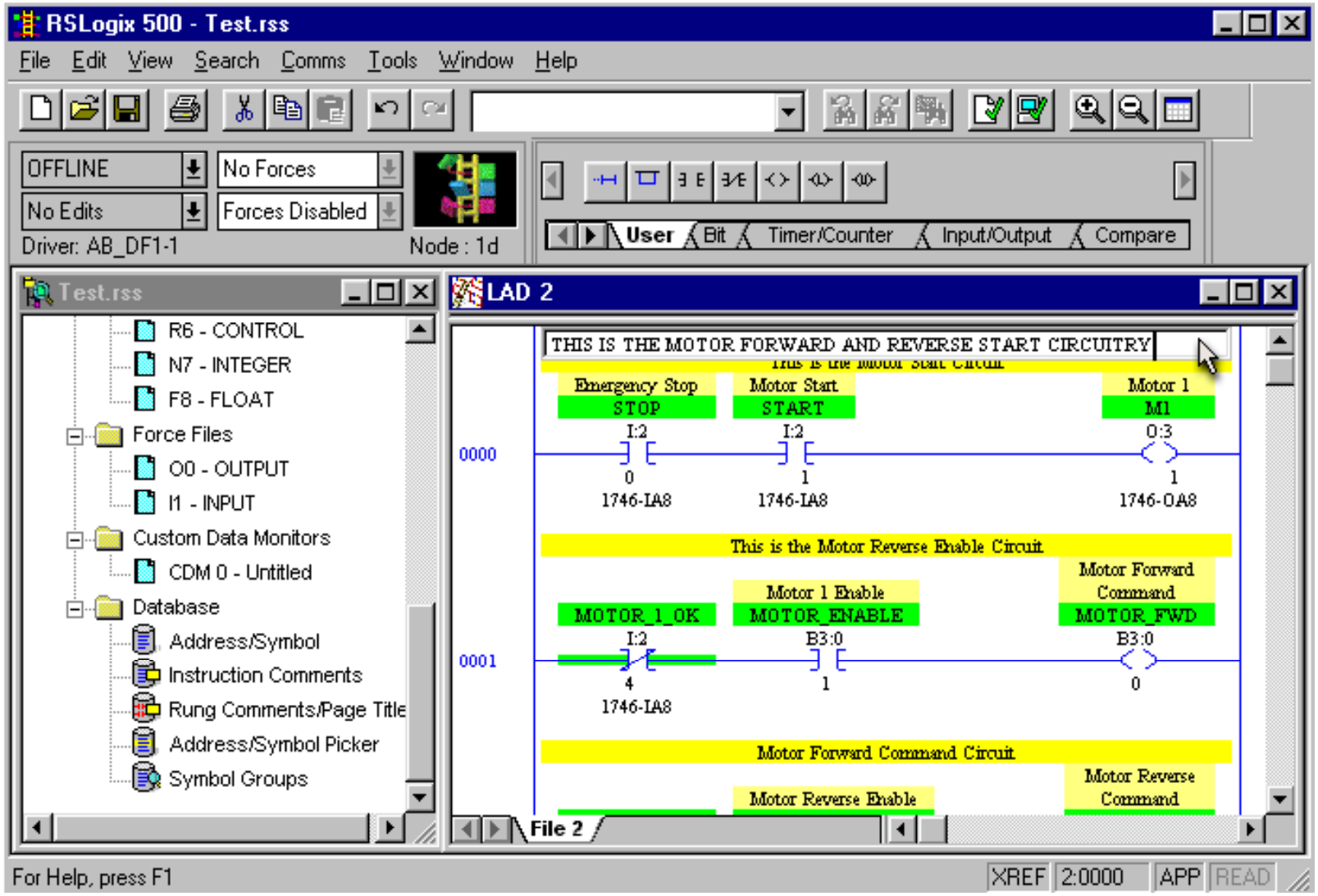
Description Editing



Rung Comment



Page Title


RSLogix 500 - Test.rss
File Edit View Search Comms Tools Window Help
OFFLINE
No Forces
No Edits
Forces Disabled
Driver: AB_DF1-1
Node : 1d
User Bit Timer/Counter Input/Output Compare
Test.rss
R6 - CONTROL
N7 - INTEGER
F8 - FLOAT
Force Files
O0 - OUTPUT
I1 - INPUT
Custom Data Monitors
CDM 0 - Untitled
Database
Address/Symbol
Instruction Comments
Rung Comments/Page Title
Address/Symbol Picker
Symbol Groups
LAD 2
THIS IS THE MOTOR FORWARD AND REVERSE START CIRCUITRY
Emergency Stop
STOP
I:2
0
1746-IA8
Motor Start
START
I:2
1
1746-IA8
Motor 1
M1
O:3
1
1746-OA8
0000
This is the Motor Reverse Enable Circuit
MOTOR_1_OK
I:2
4
1746-IA8
Motor 1 Enable
MOTOR_ENABLE
B3:0
1
Motor Forward Command
MOTOR_FWD
B3:0
0
0001
Motor Forward Command Circuit
Motor Reverse Enable
Motor Reverse Command
File 2
For Help, press F1
XREF 2:0000 APP READ