SCADA (ISS0089)

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Roadmap

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Roadmap

- Introduction to SCADA
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Roadmap

- Introduction to SCADA
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Timeline

Schedule

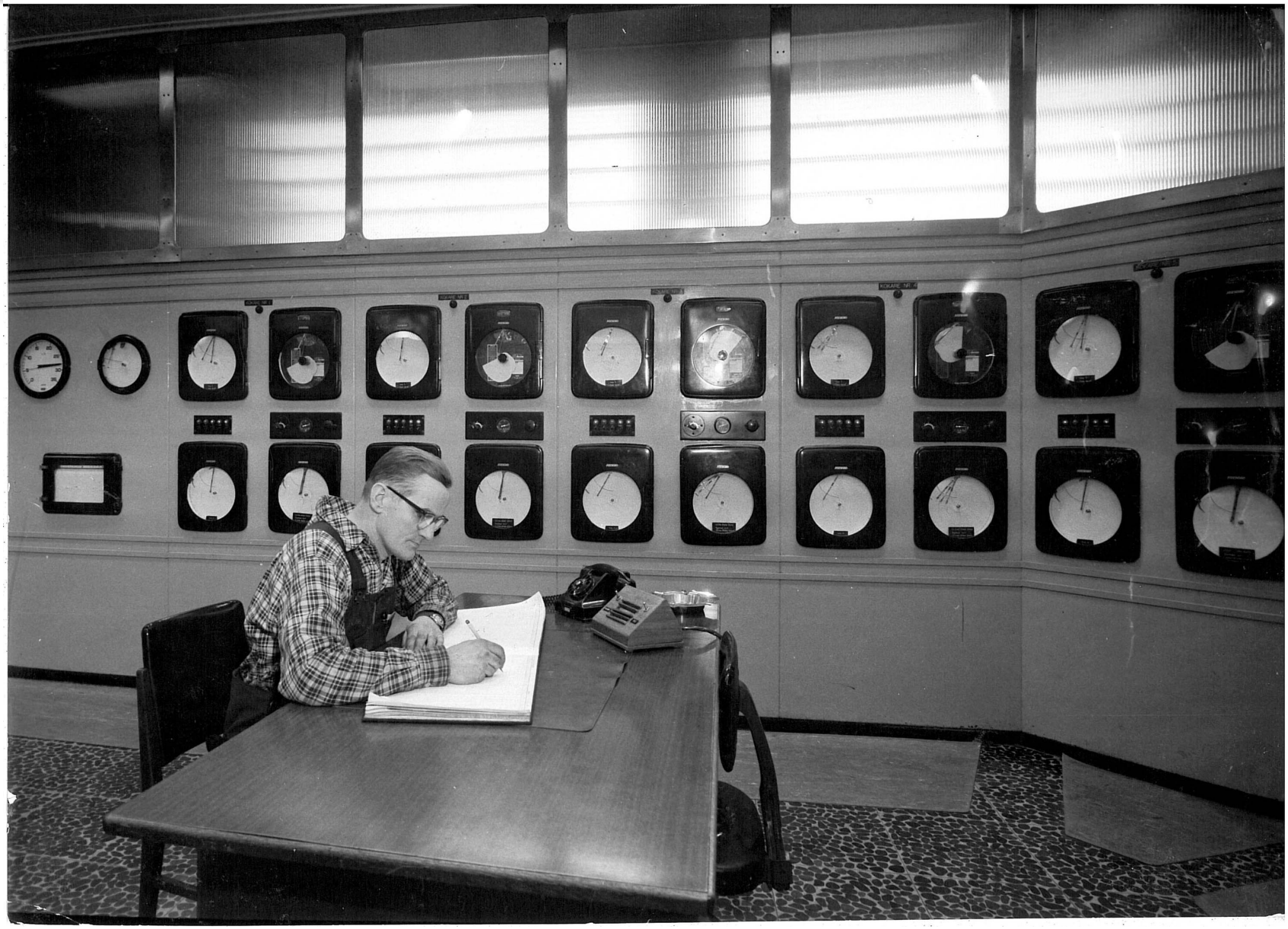
Schedule

- 2 weeks for classes

Schedule

- 2 weeks for classes
- 2 weeks for homework

SCADA



Definition

SCADA

SCADA

- S supervisory

SCADA

- S supervisory
- C control

SCADA

- S supervisory
- C control
- A and

SCADA

- S supervisory
- C control
- A and
- D data

SCADA

- S supervisory
- C control
- A and
- D data
- A acquisition

Motivation

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- LOVE IT

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  - distributed control system

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  - universal means of remote access

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  - different manufacturers

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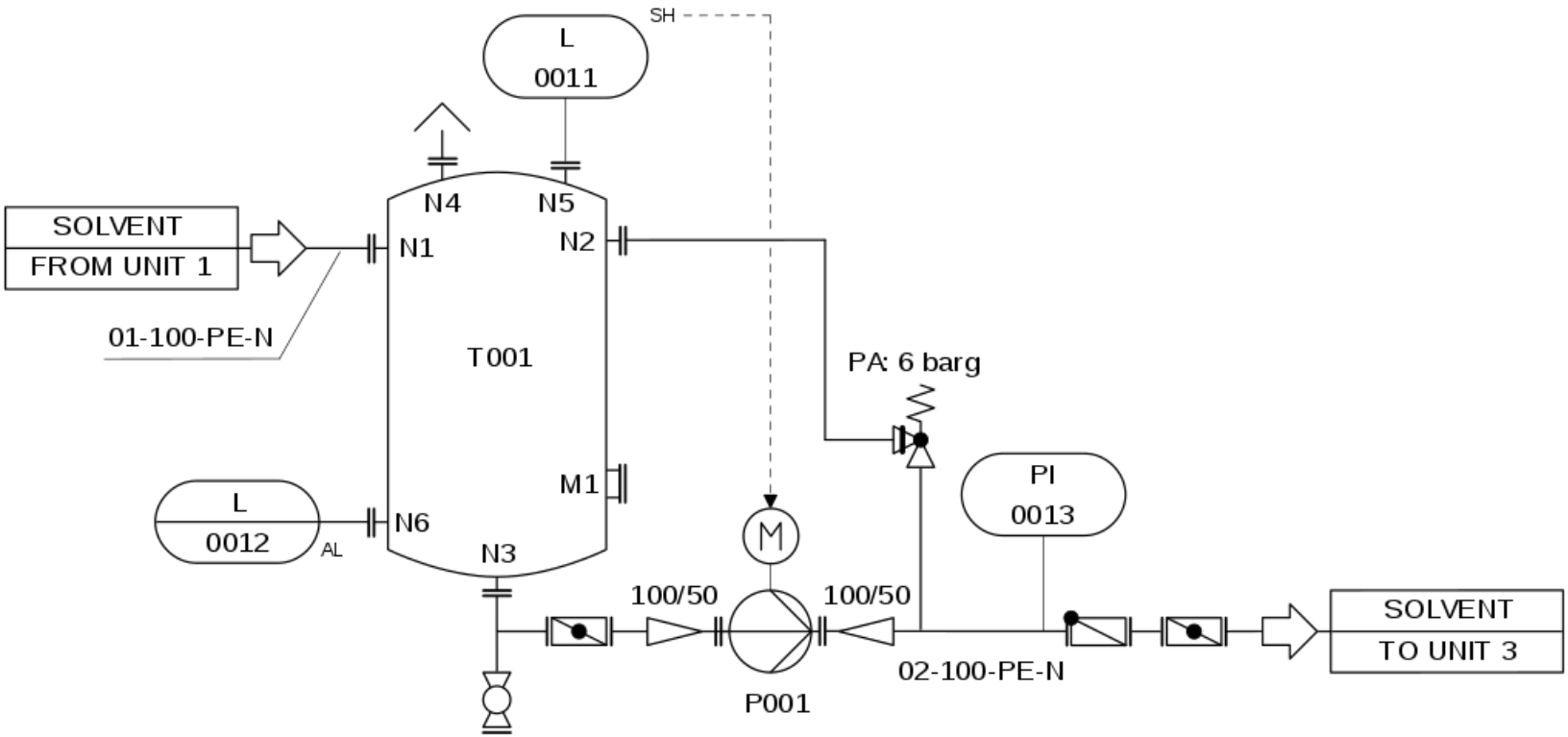
Motivation

- LOVE IT
  - distributed control system
  - universal means of remote access
  - different manufacturers
  - standard automation protocols
  - most commonly-used industrial control system
- HATE IT
  - vulnerable to cyberwarfare/cyberterrorism attacks

Common use

	T001	P001
SERVICE	STORAGE TANK	FEED PUMP
DATA	DIAMETER: 1000 mm HEIGHT: 3000 mm CAPACITY: 2.4 m3	FLOW RATE: 5 m3/h DIFF. PRESSURE: 2.5 bar
DESIGN PRESSURE	10 b arg	10 b arg
DESIGN TEMP.	50 °C	50 °C



P&ID

P&ID

P piping

P&ID

P piping

& and

P&ID

- P piping
- & and
- I instrumentation

P&ID

- P piping
- & and
- I instrumentation
- D diagram

Homework

Task

Homework description

Design a SCADA operator interface (HMI) on PC for two PLC system using InTouch or some other industrial HMI design software.

Requirements

Do not forget

Do not forget

- homework task is individual work

Do not forget

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- must use the two PLCs through internet

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- HMI should be understandable and interpretable without the help of a user manual

Do not forget

- homework task is individual work
- must use the two PLCs through internet
- HMI should be understandable and interpretable without the help of a user manual
- in your report show interface window(s), control variables (tagnames) list and communication server configuration settings views

Deadlines

Schedule

Not later than three weeks from first SCADA class!

Evaluation

Grading: the 4 musts

Grading: the 4 musts

25% must work

Grading: the 4 musts

25% must work

25% must be clear

Grading: the 4 musts

25% must work

25% must be clear

25% must use the two PLCs

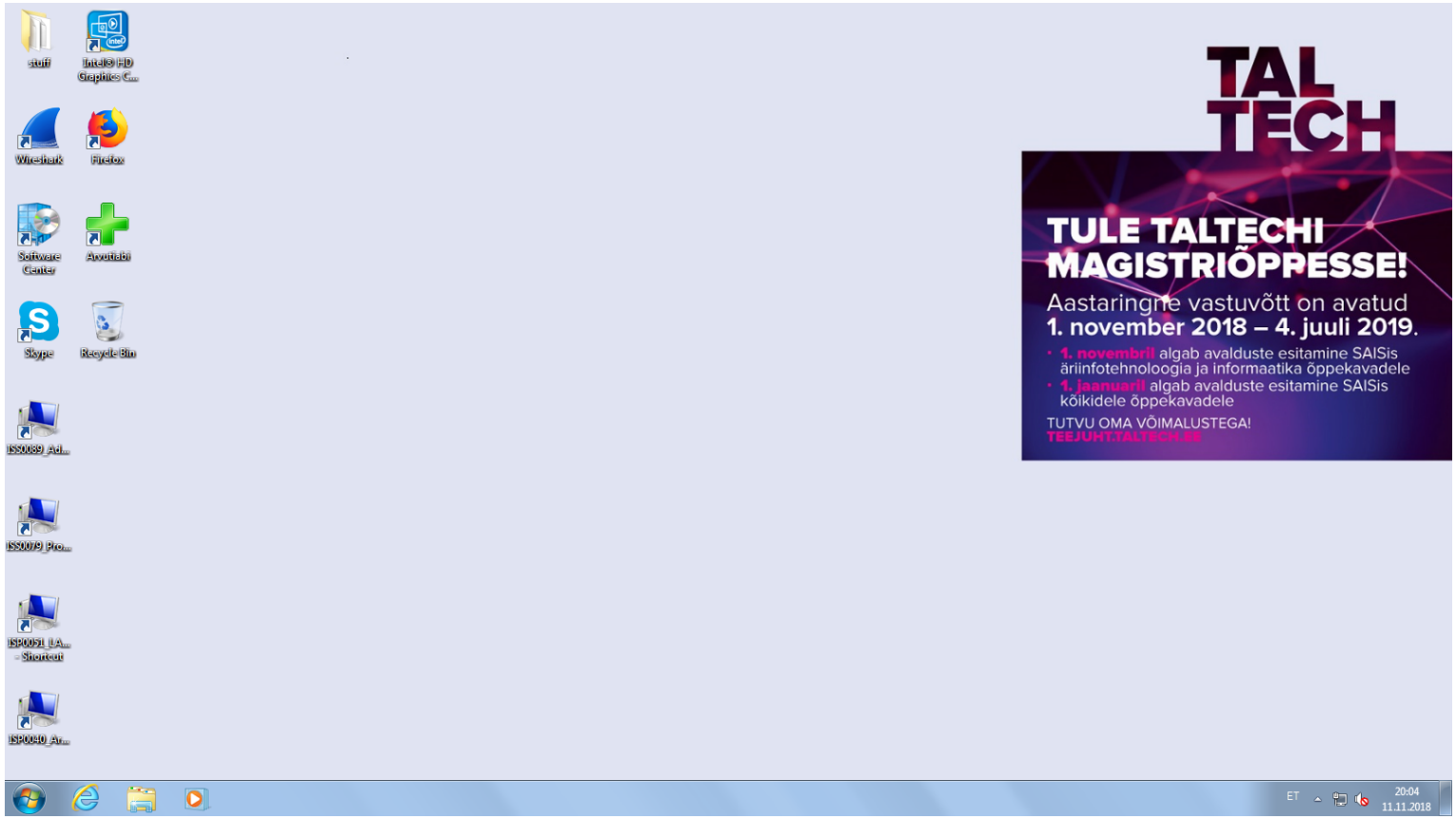
Grading: the 4 musts

25% must work
25% must be clear
25% must use the two PLCs
25% must be on time

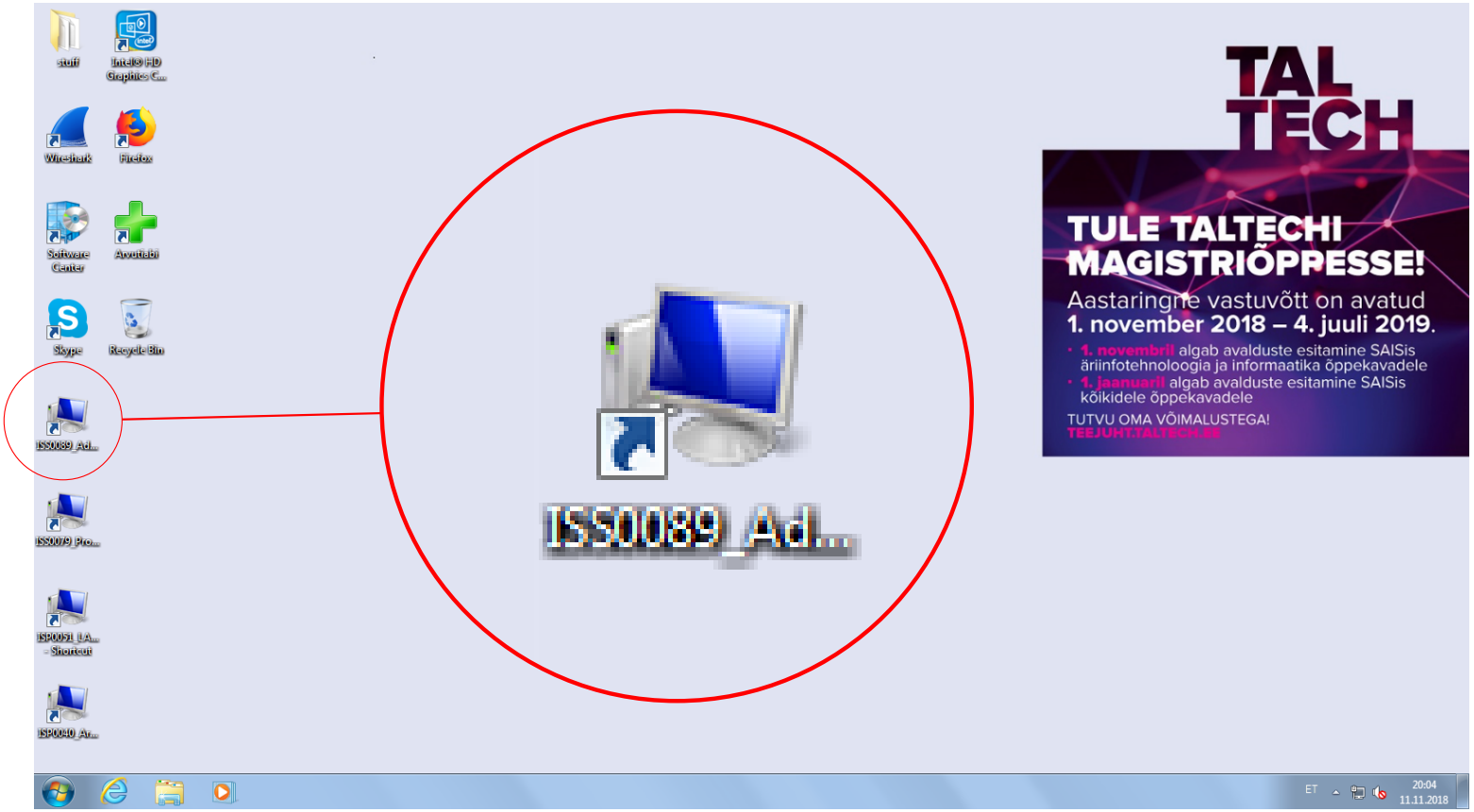
Practical tasks

Setup

VirtualBox: launch



VirtualBox: launch

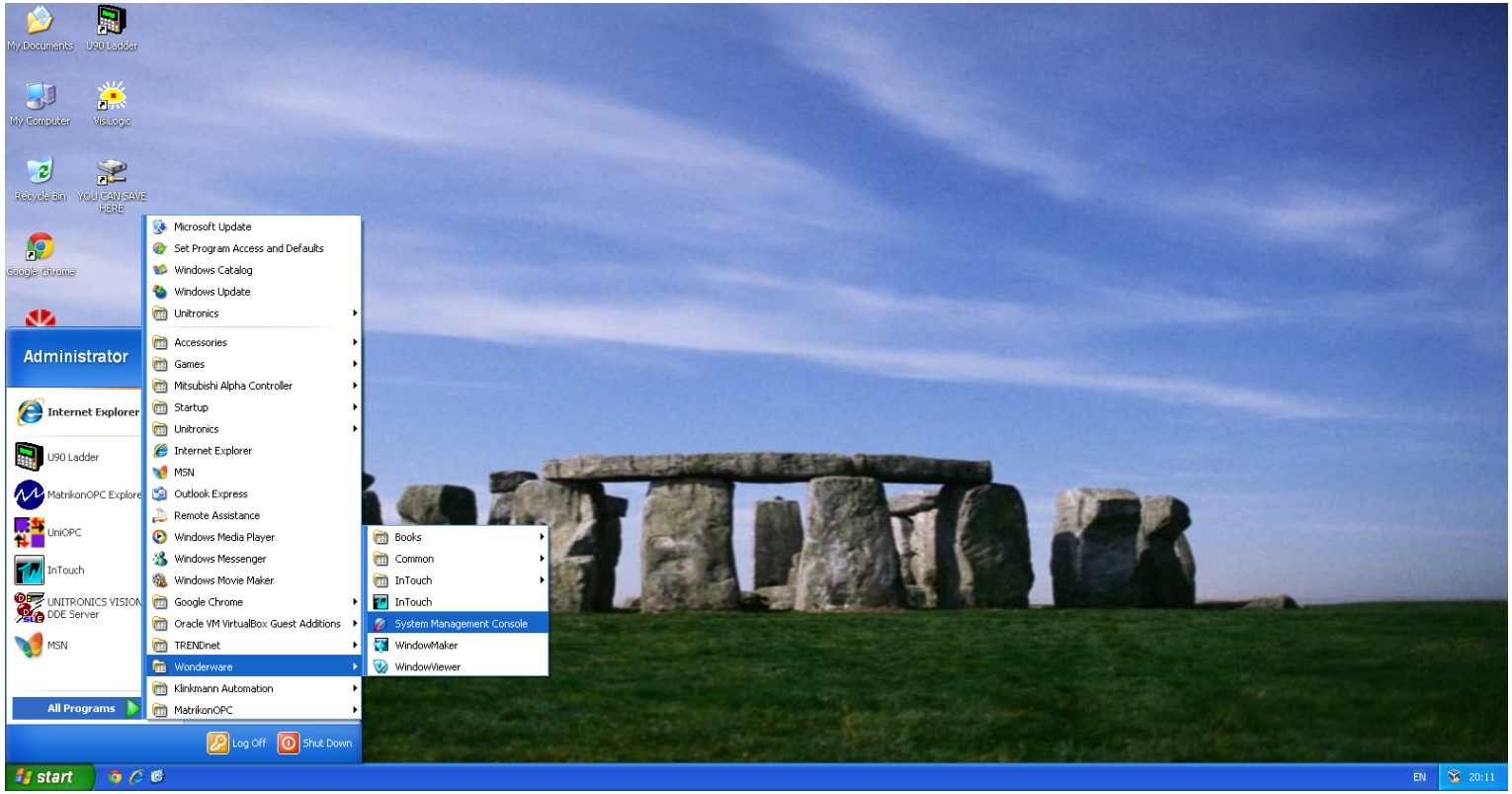


SCADA

SMC: launch


My Documents
U90 Ladder
My Computer
VisiLogic
Recycle Bin
YOU CAN SAVE HERE
Google Chrome
Unitronics
Alpha Programming
Internet Explorer
Remote Access
start
EN
20:10

SMC: launch


My Documents
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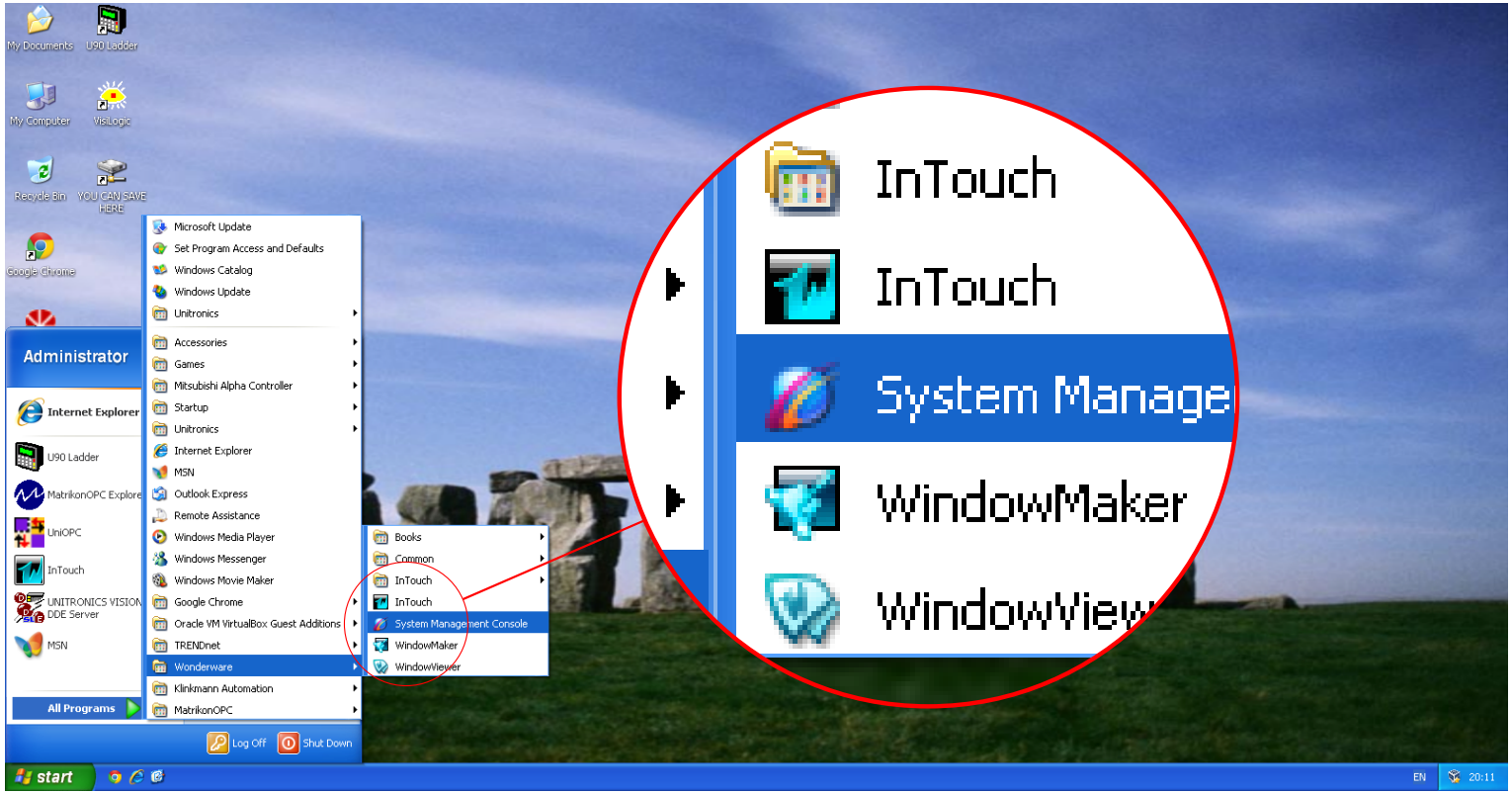
YOU CAN SAVE HERE
Google Chrome
Administrator
Internet Explorer
U90 Ladder
MatrikonOPC Explore
UniOPC
InTouch
UNITRONICS VISION OPC DDE Server
MSN
All Programs
Microsoft Update
Set Program Access and Defaults
Windows Catalog
Windows Update
Unitronics
Accessories
Games
Mitsubishi Alpha Controller
Startup
Unitronics
Internet Explorer
MSN
Outlook Express
Remote Assistance
Windows Media Player
Windows Messenger
Windows Movie Maker
Google Chrome
Oracle VM VirtualBox Guest Additions
TRENDnet
Wonderware
Klinkmann Automation
MatrikonOPC
Books
Common
InTouch
InTouch
System Management Console
WindowMaker
WindowViewer
Log Off
Shut Down
start
EN
20:11

SMC: launch


InTouch
InTouch
System Manage
WindowMaker
WindowView
Administrator
Internet Explorer
U90 Ladder
InTouch
All Programs
Microsoft Update
Set Program Access and Defaults
Windows Catalog
Windows Update
Unitronics
Accessories
Games
Mitsubishi Alpha Controller
Startup
Unitronics
Internet Explorer
MSN
Outlook Express
Remote Assistance
Windows Media Player
Windows Messenger
Windows Movie Maker
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InTouch
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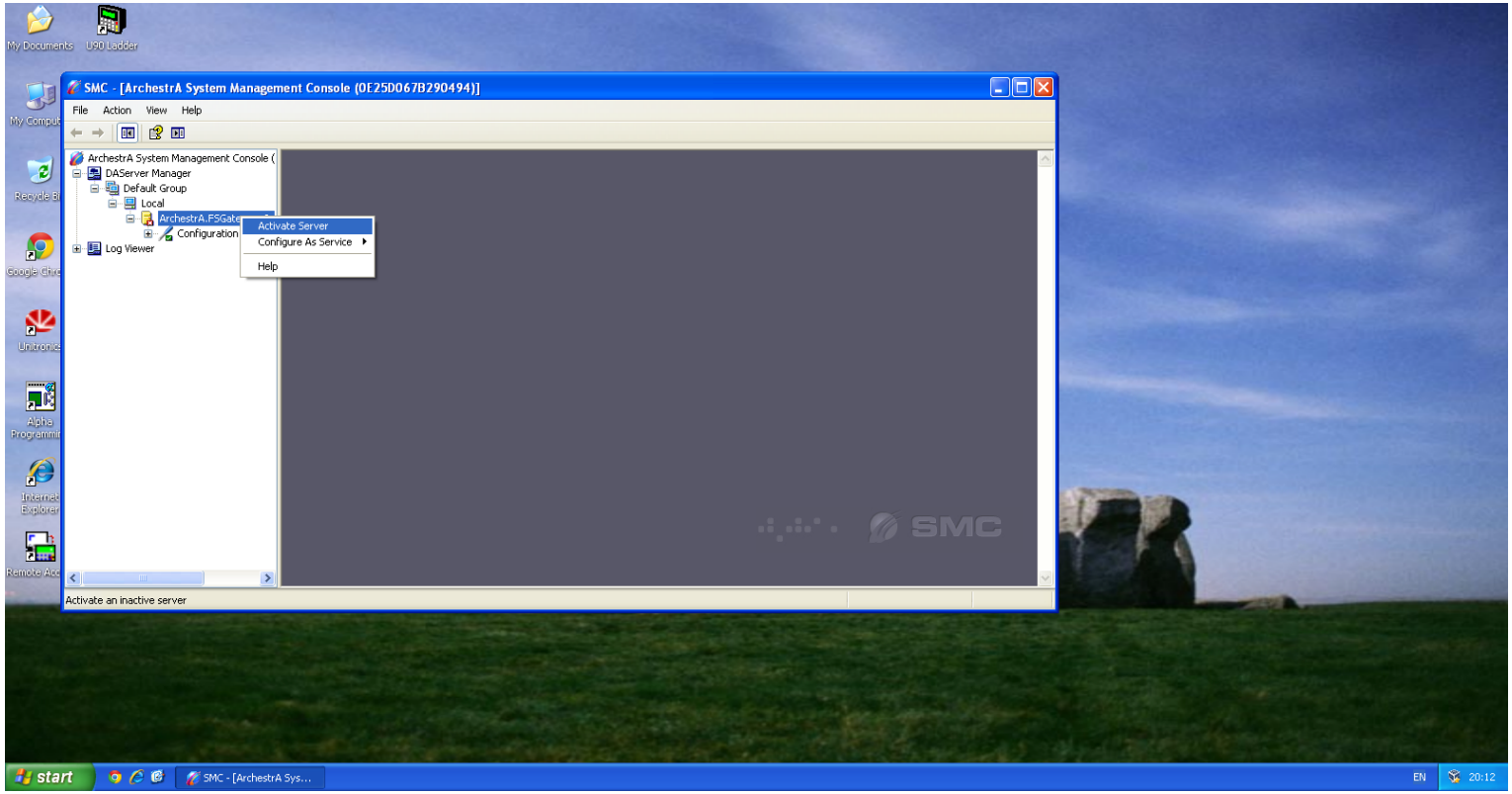
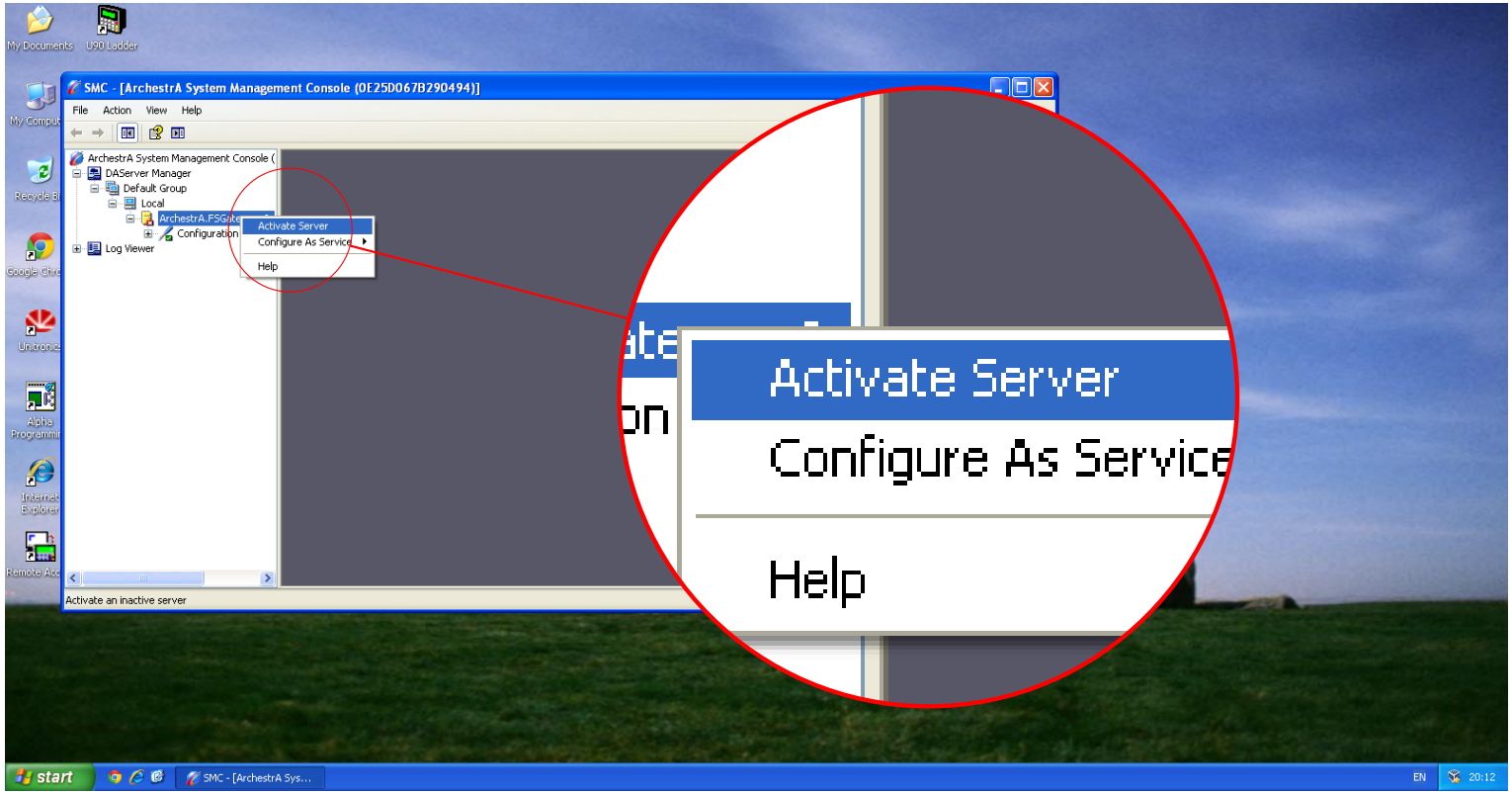
Shut Down
start

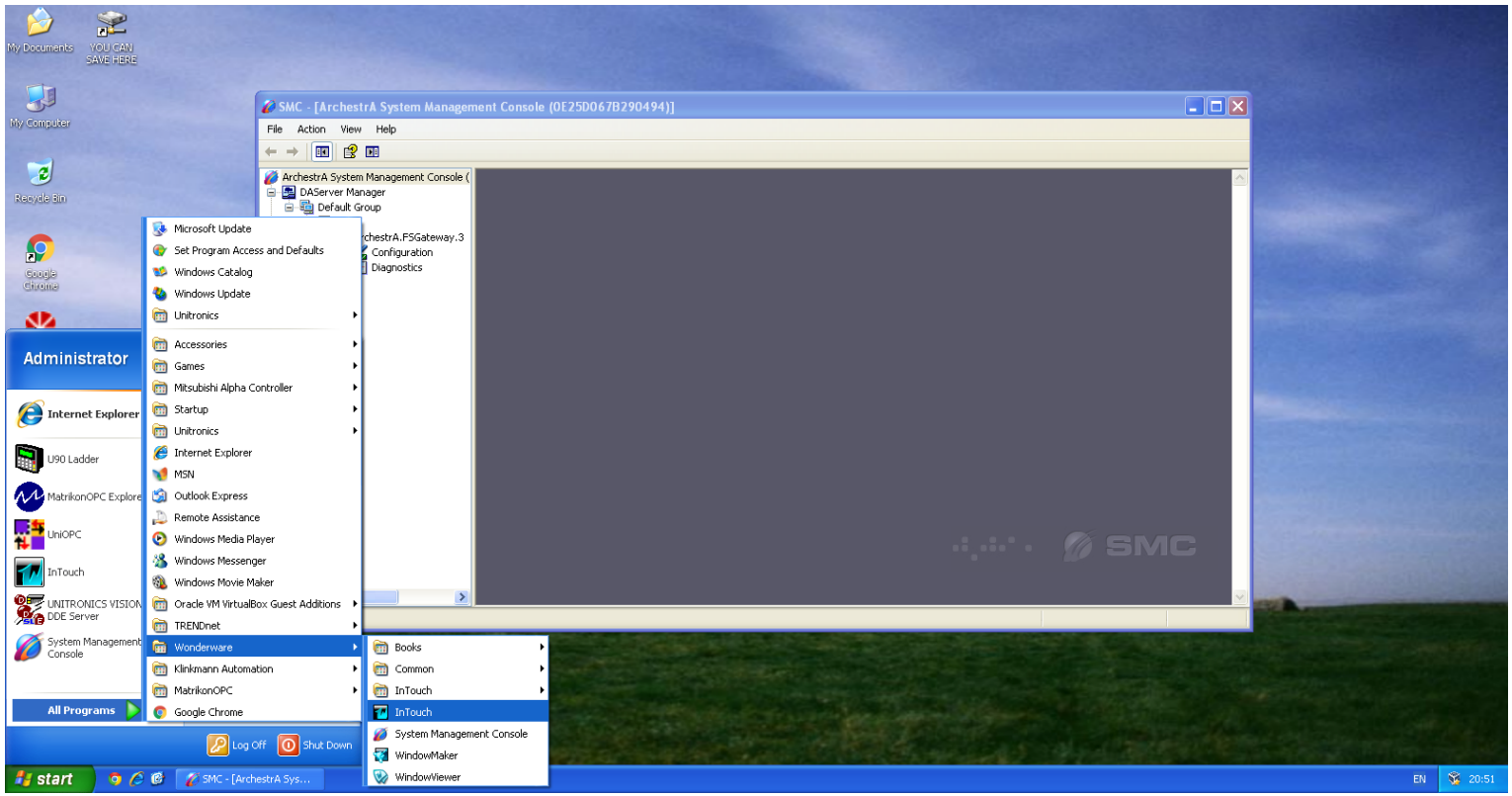
SMC: activate server



SMC: activate server



inTouch: launch



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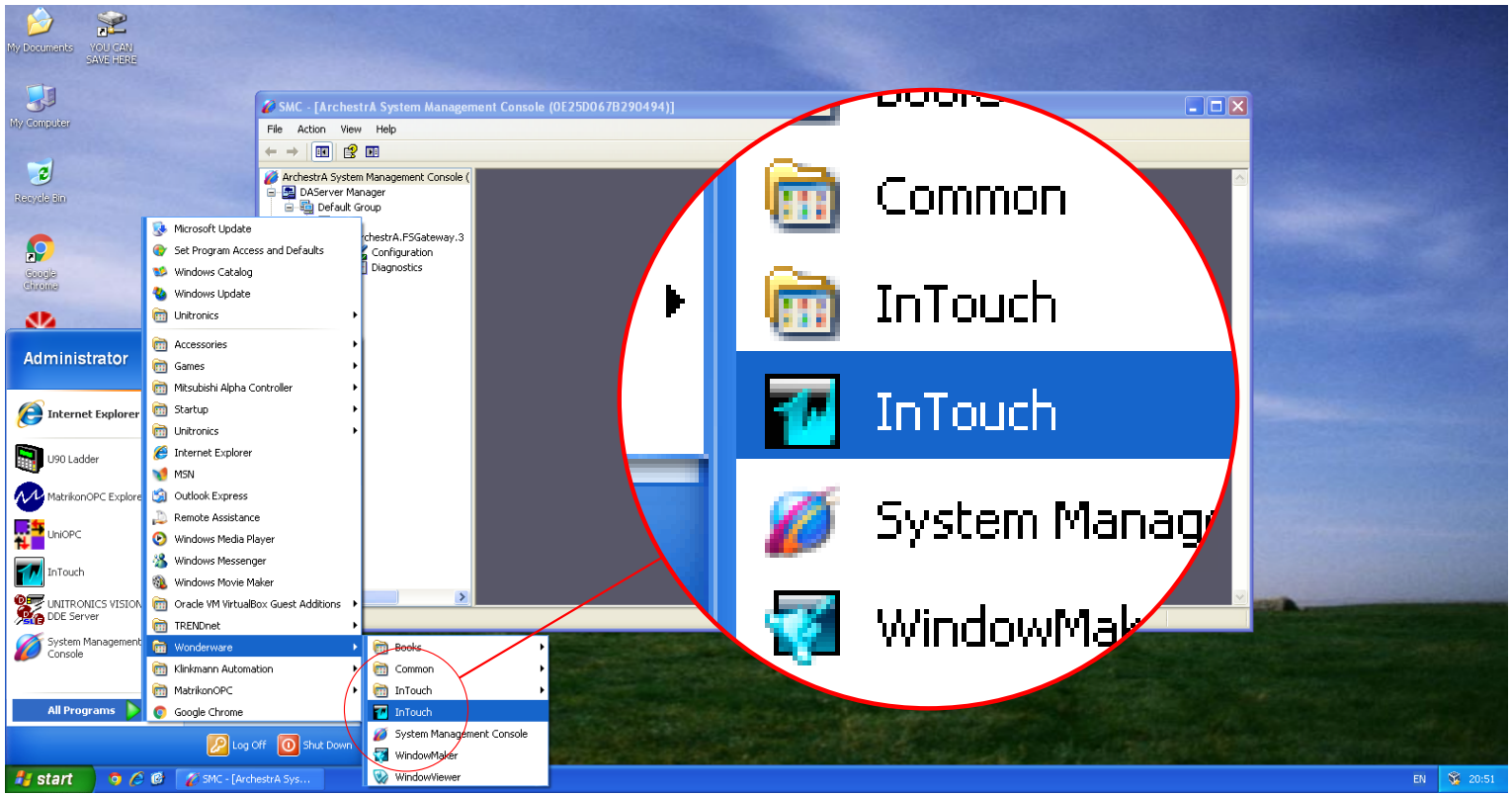

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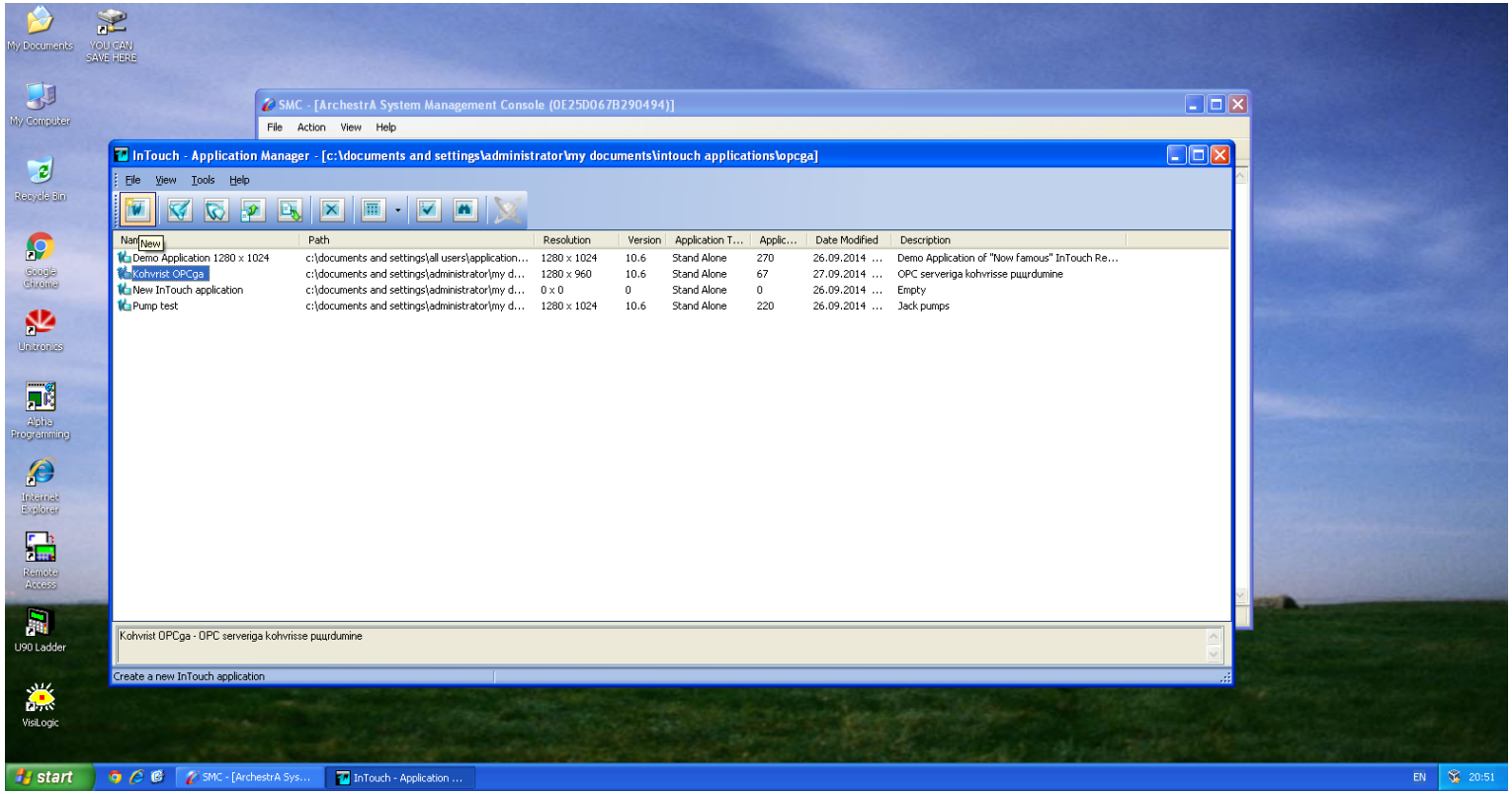

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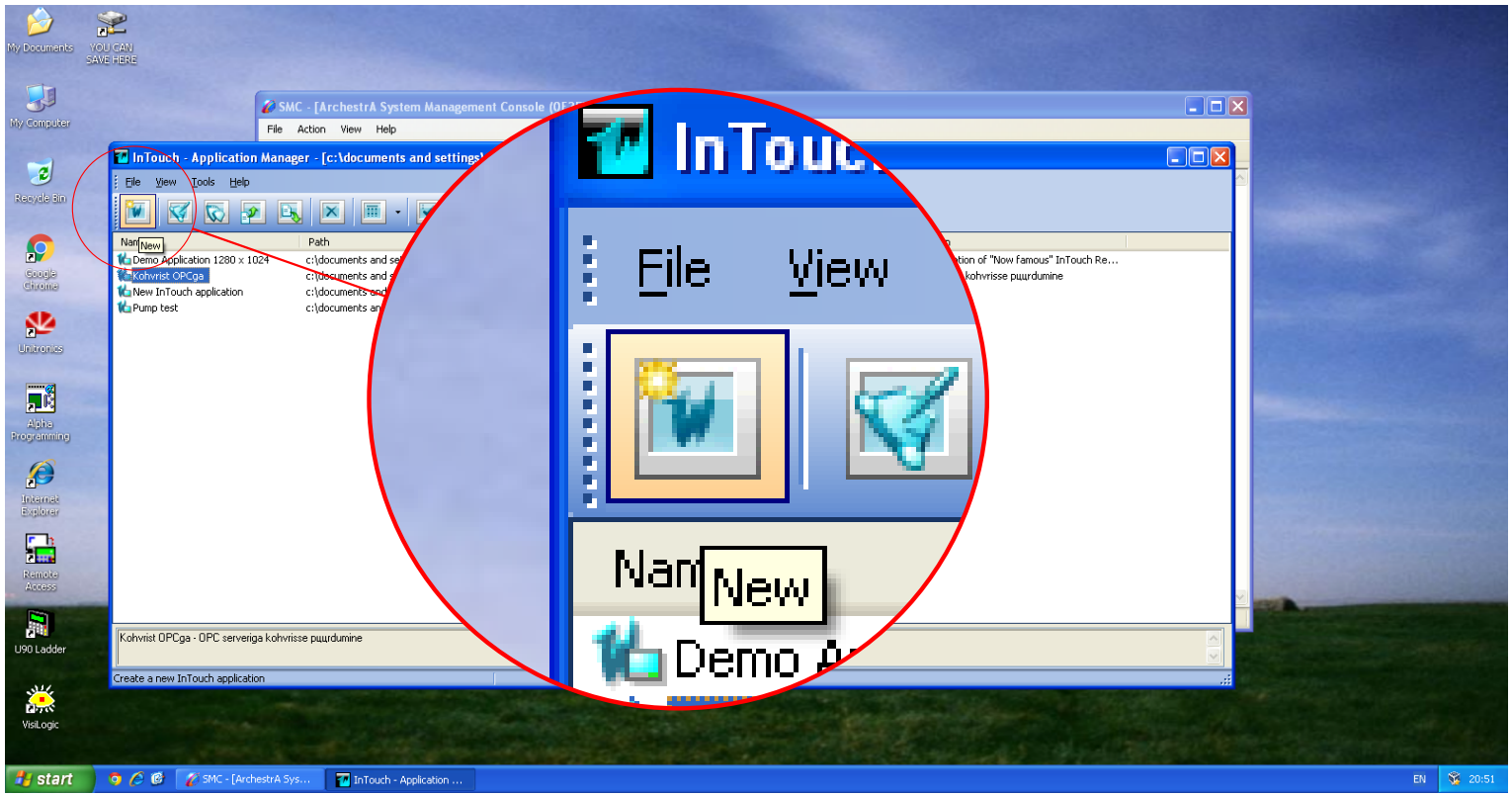

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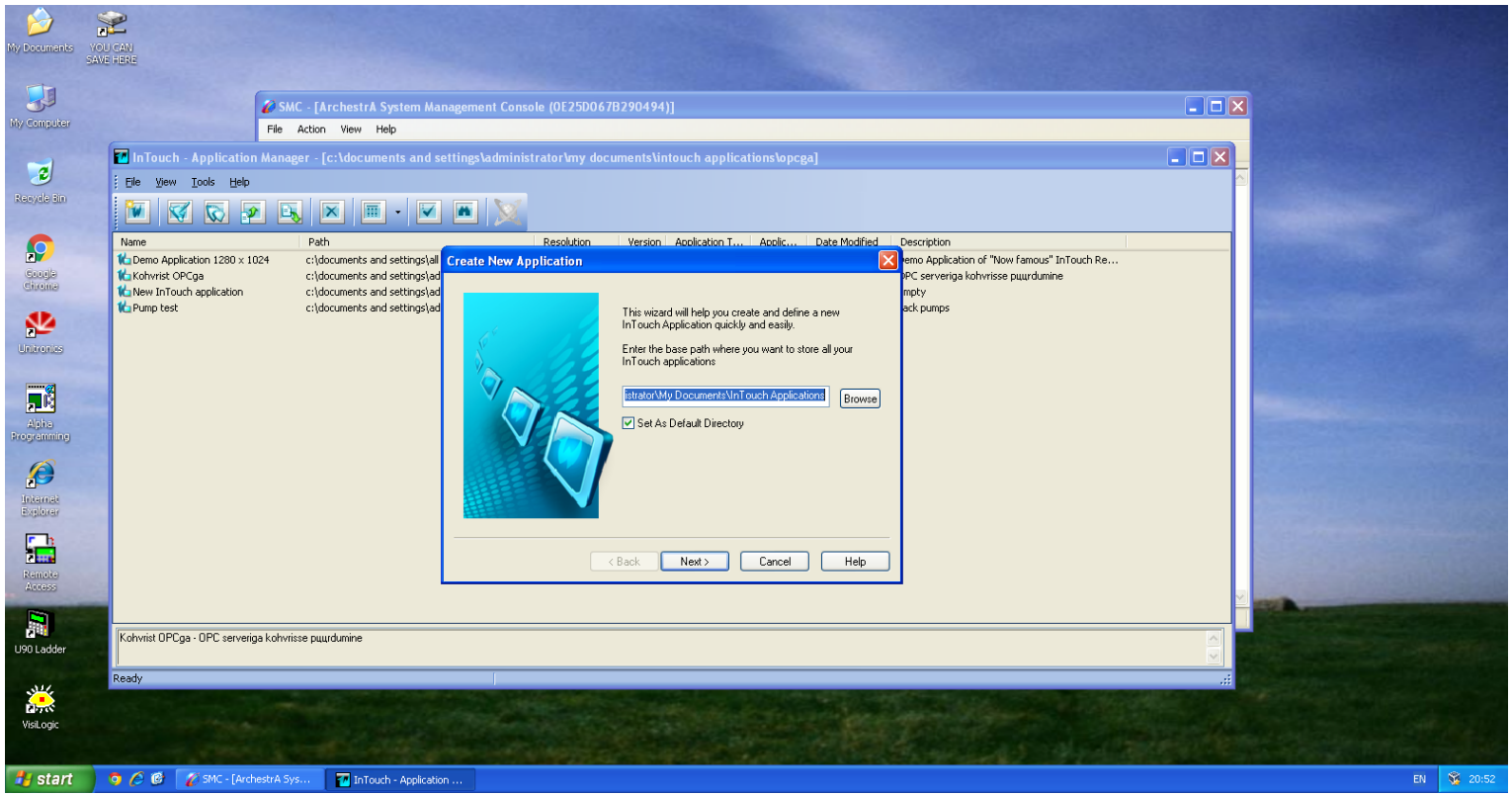

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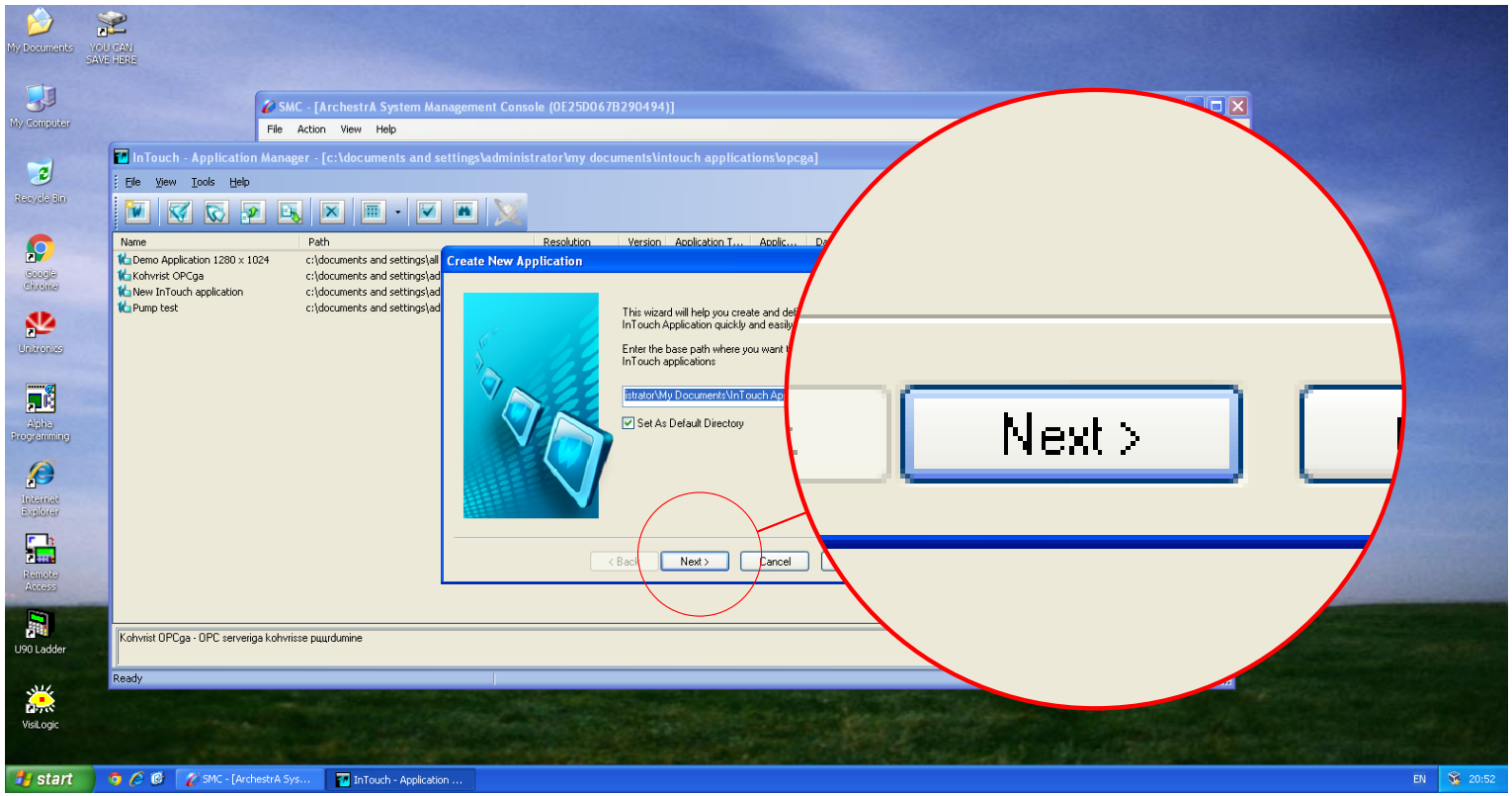

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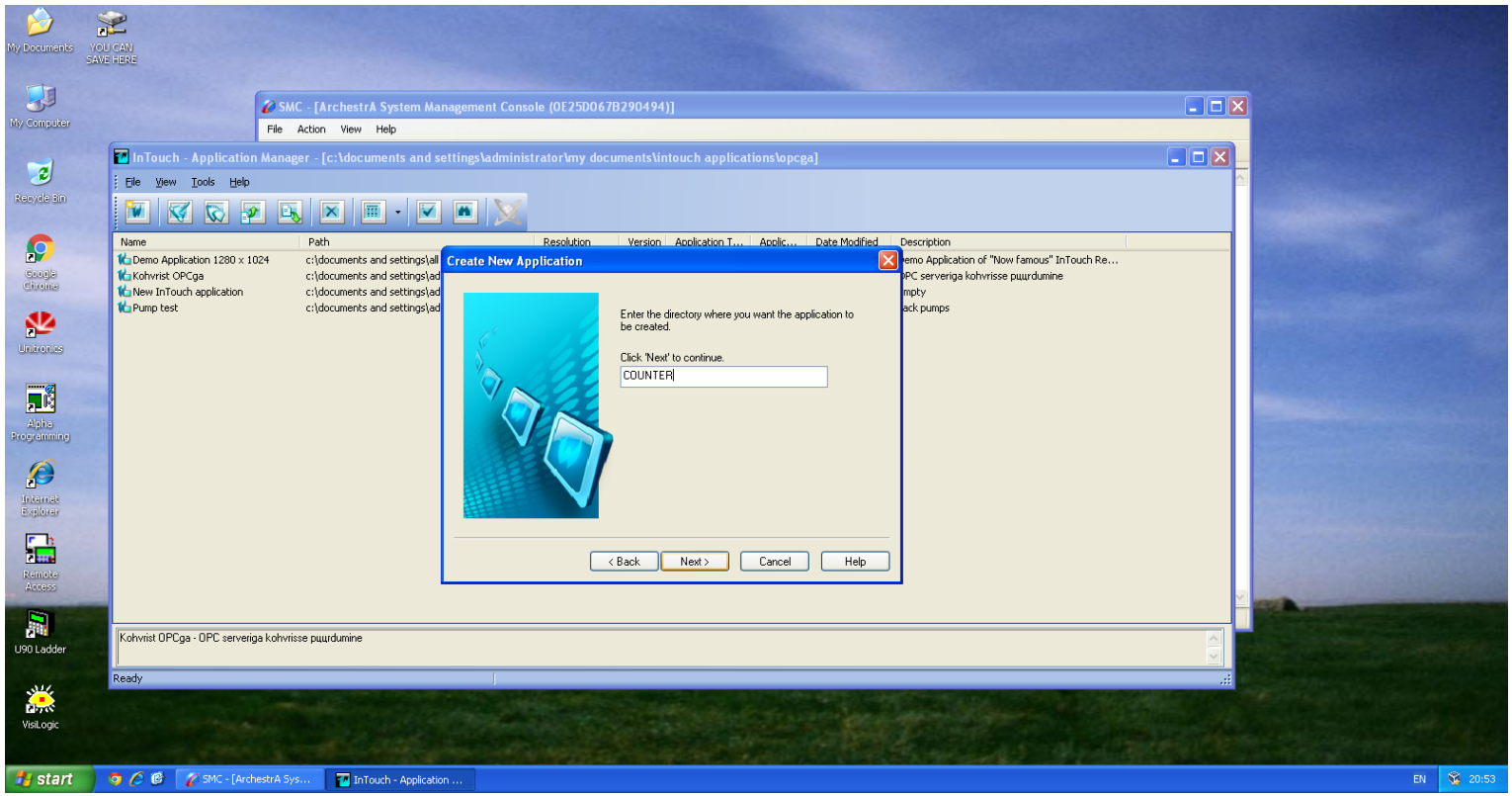

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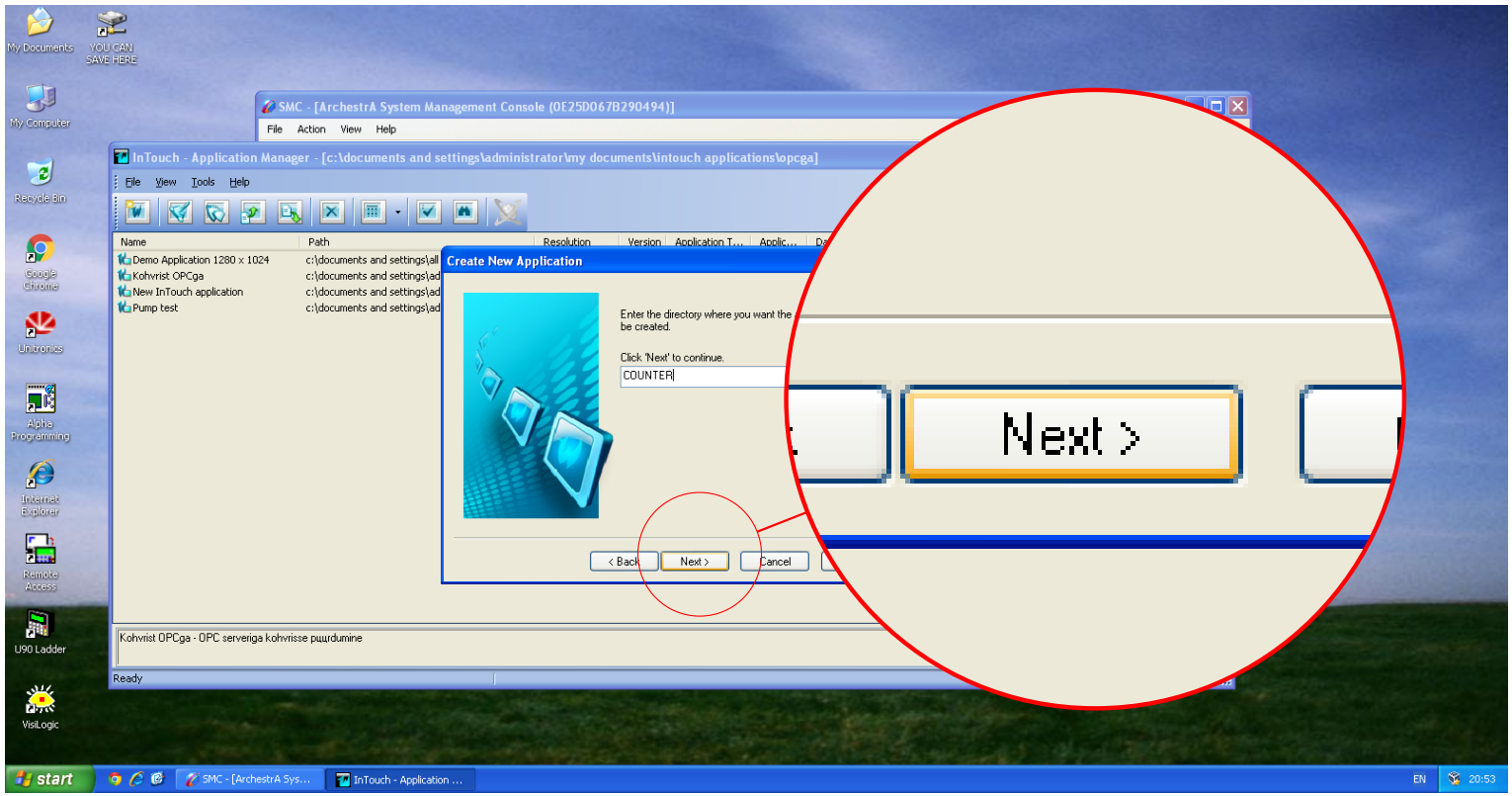

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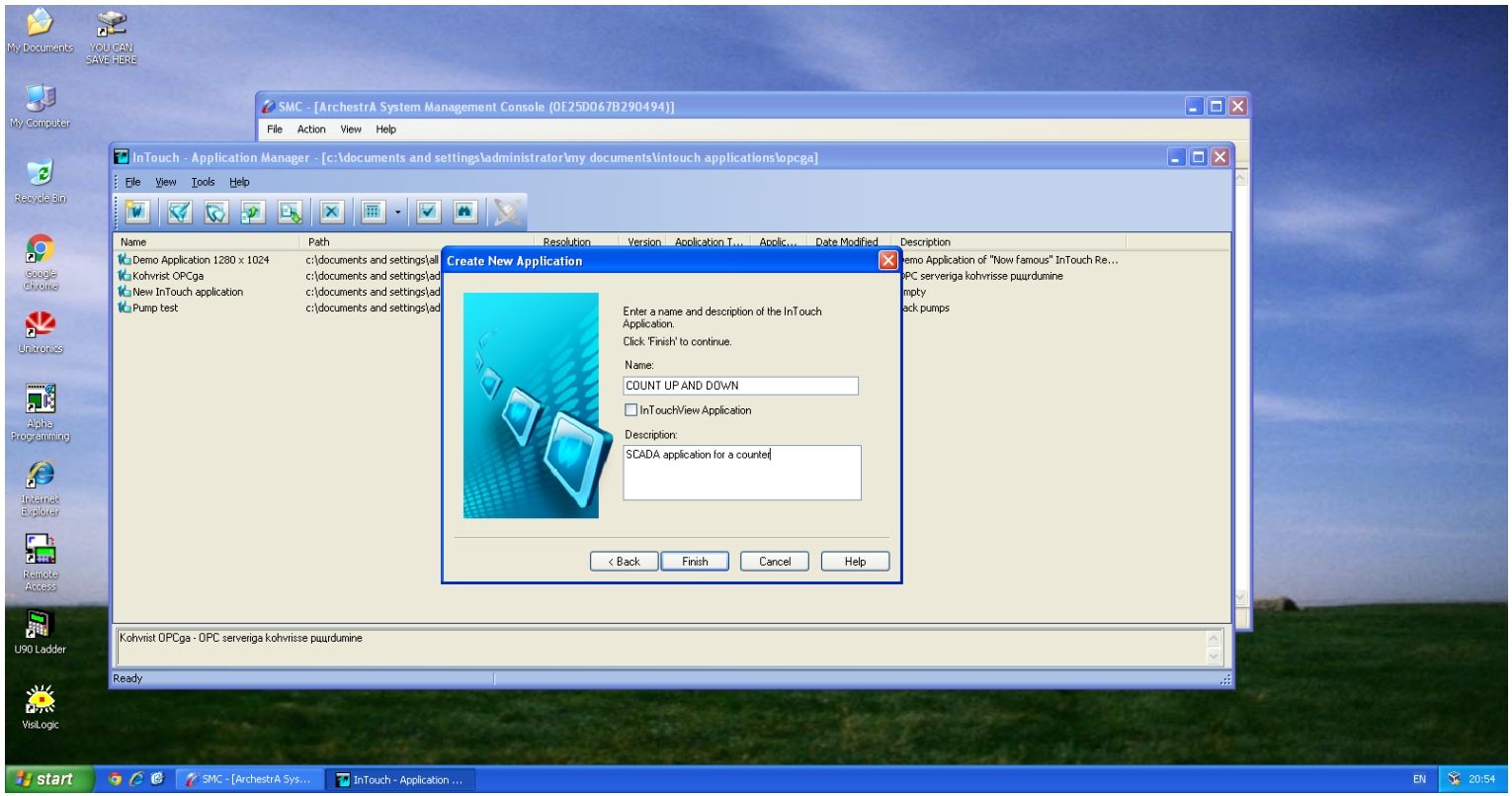

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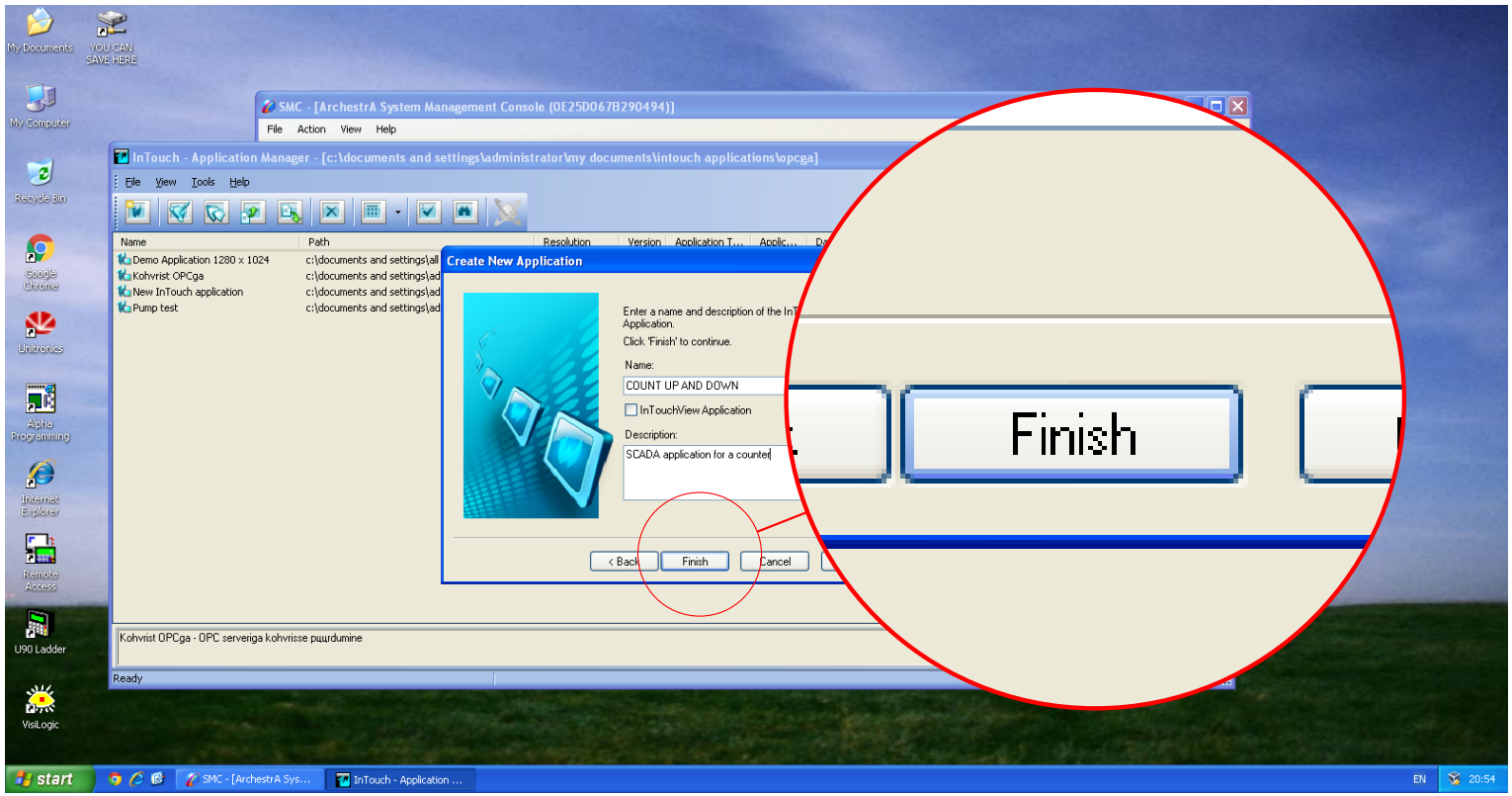

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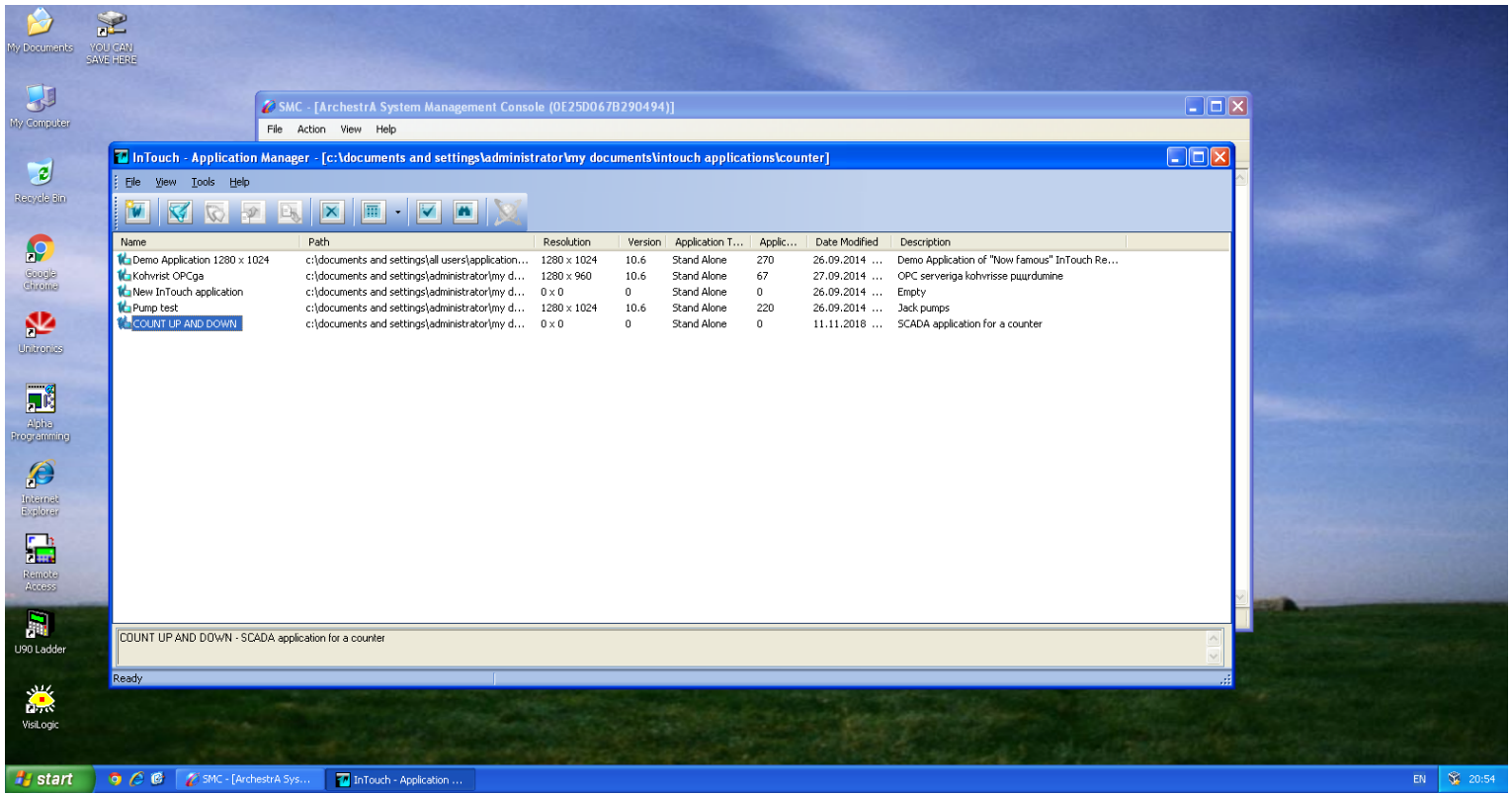

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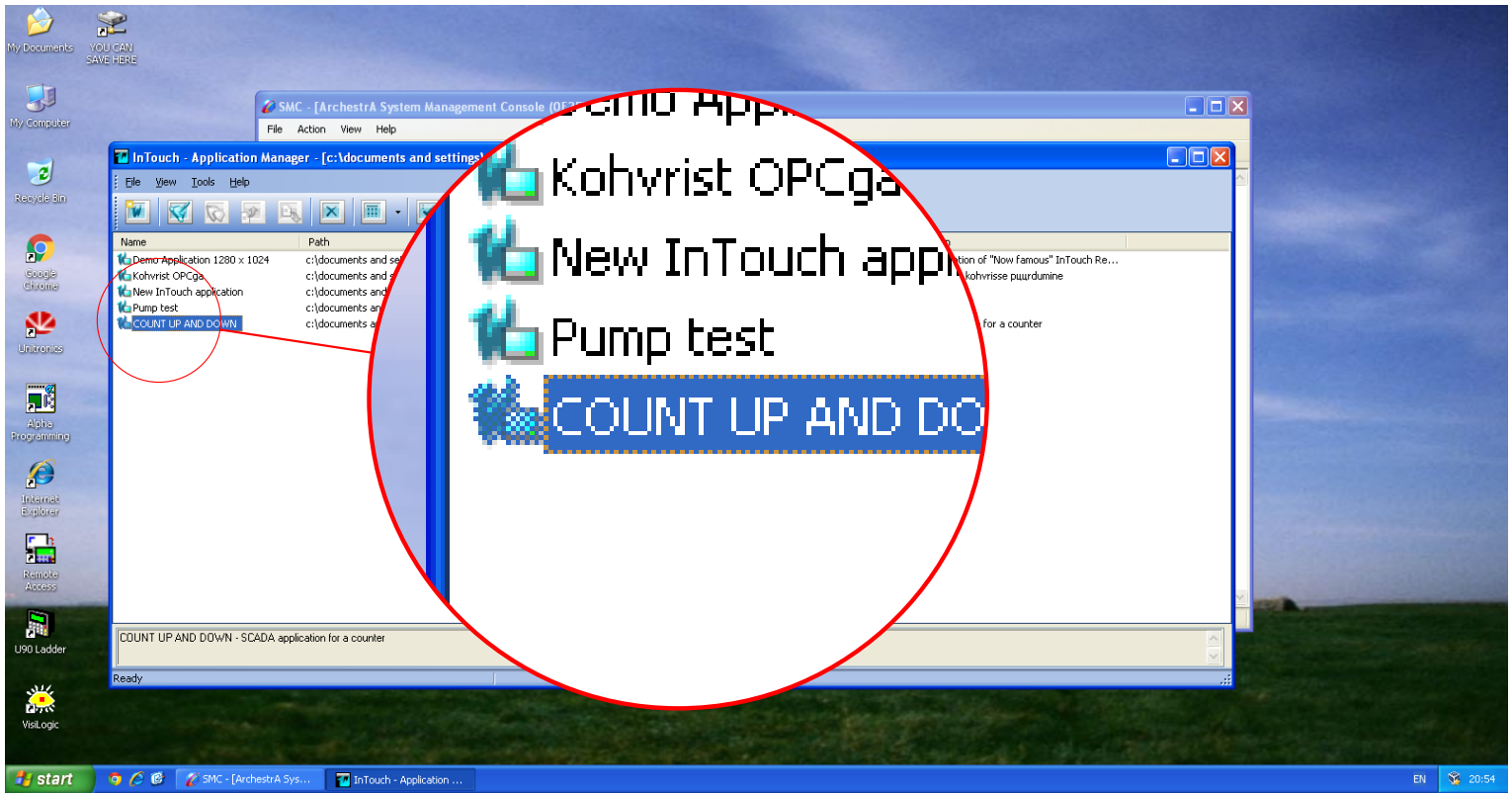

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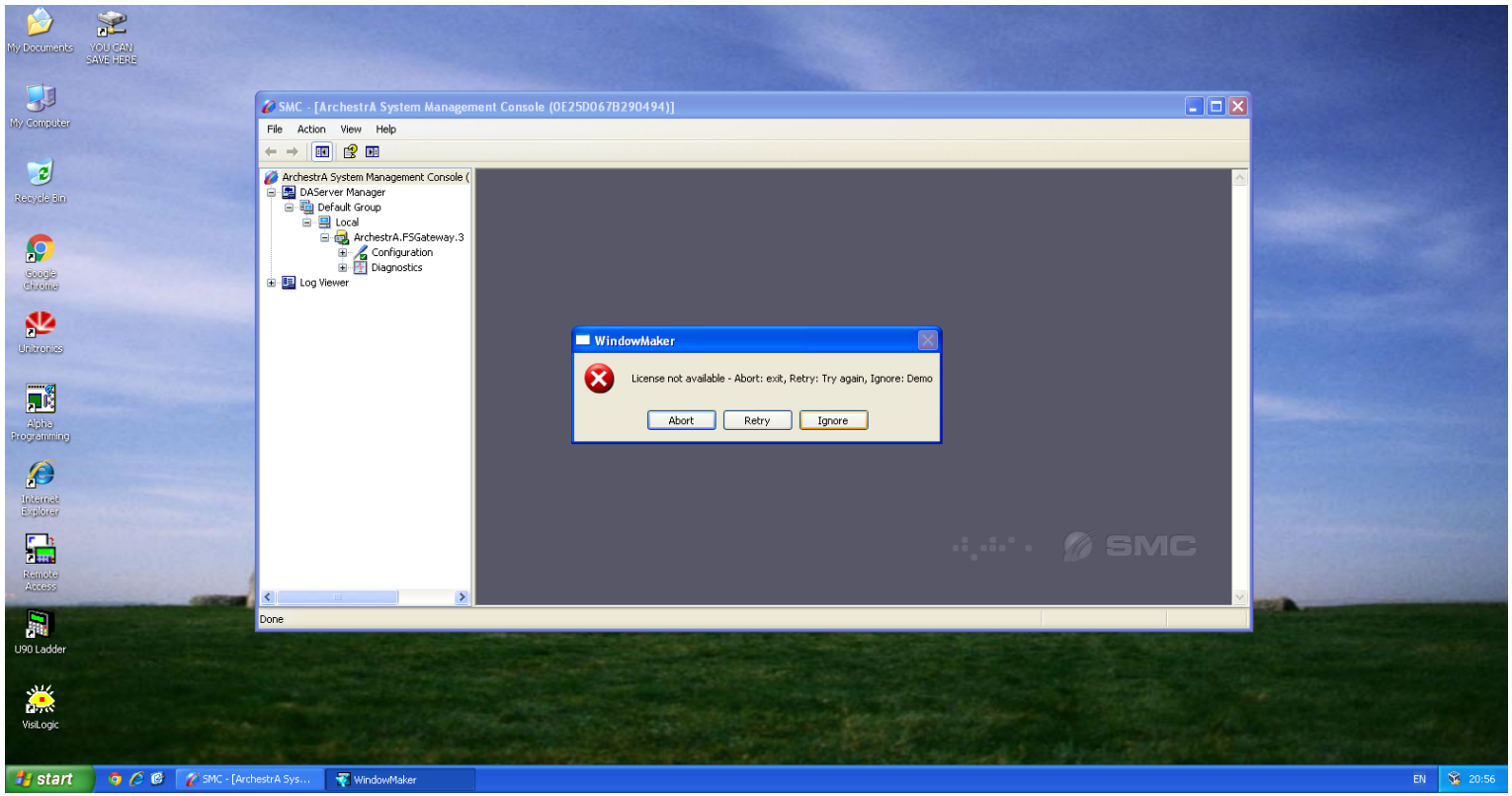

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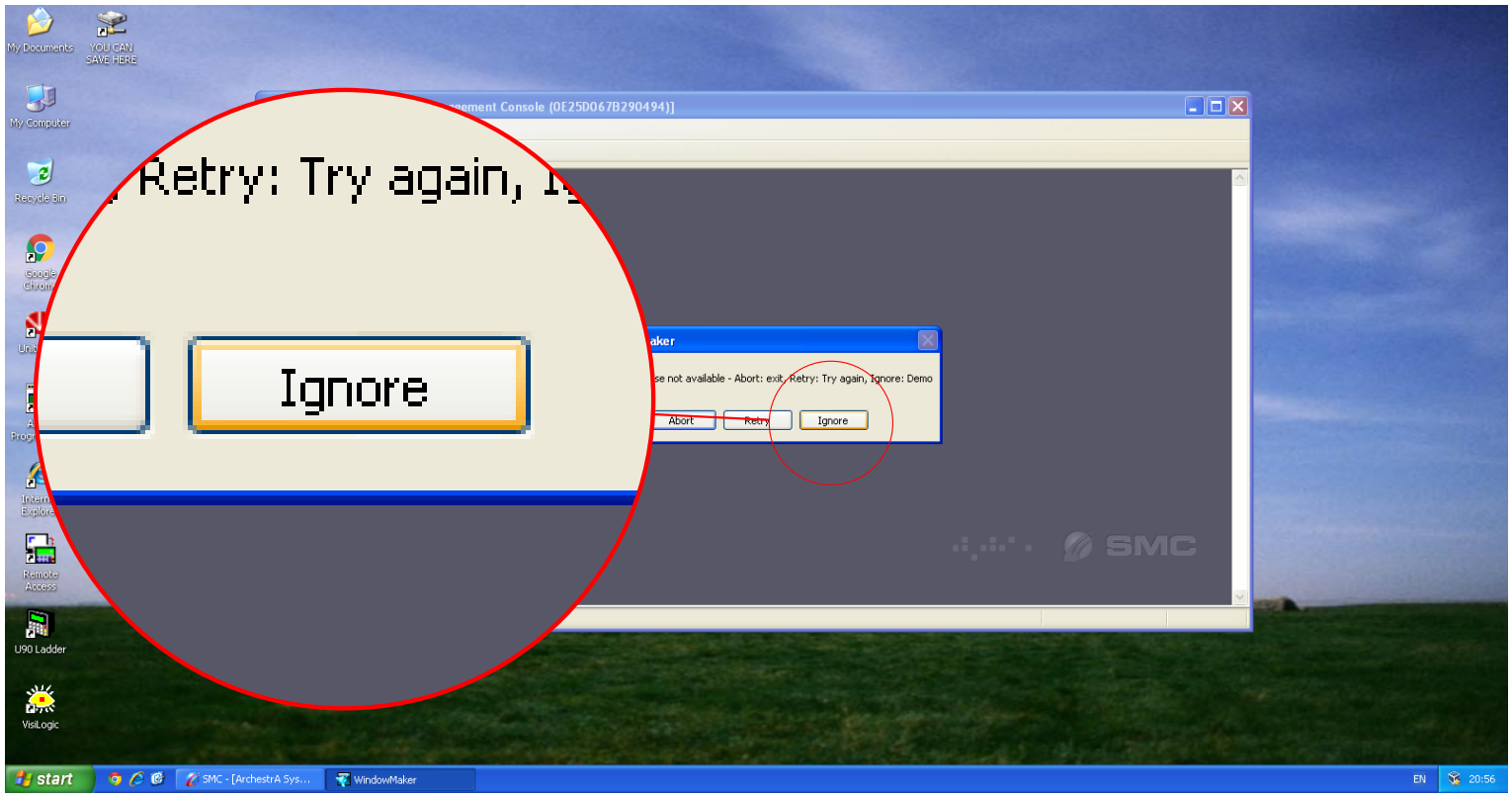
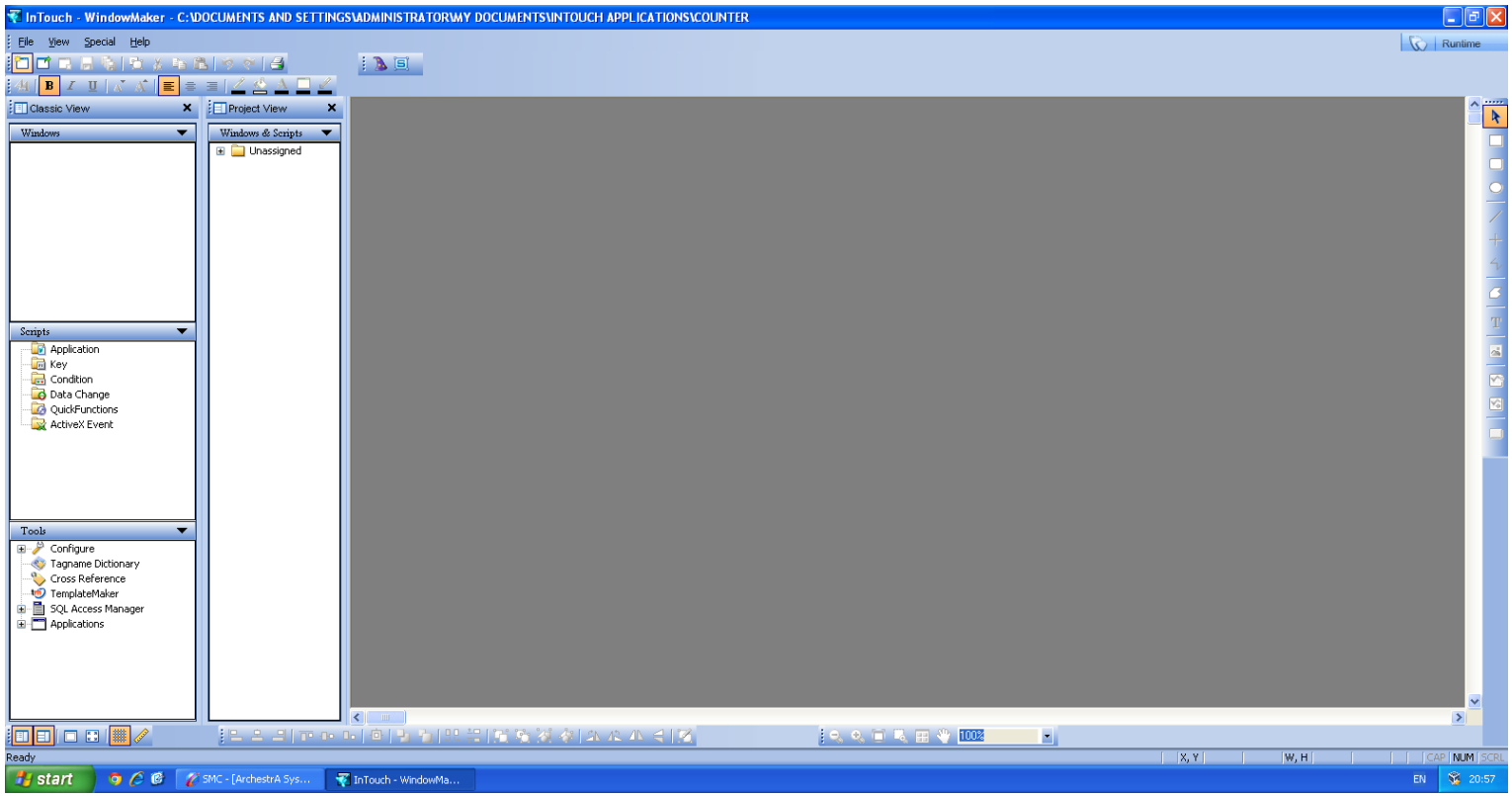


inTouch: make new window



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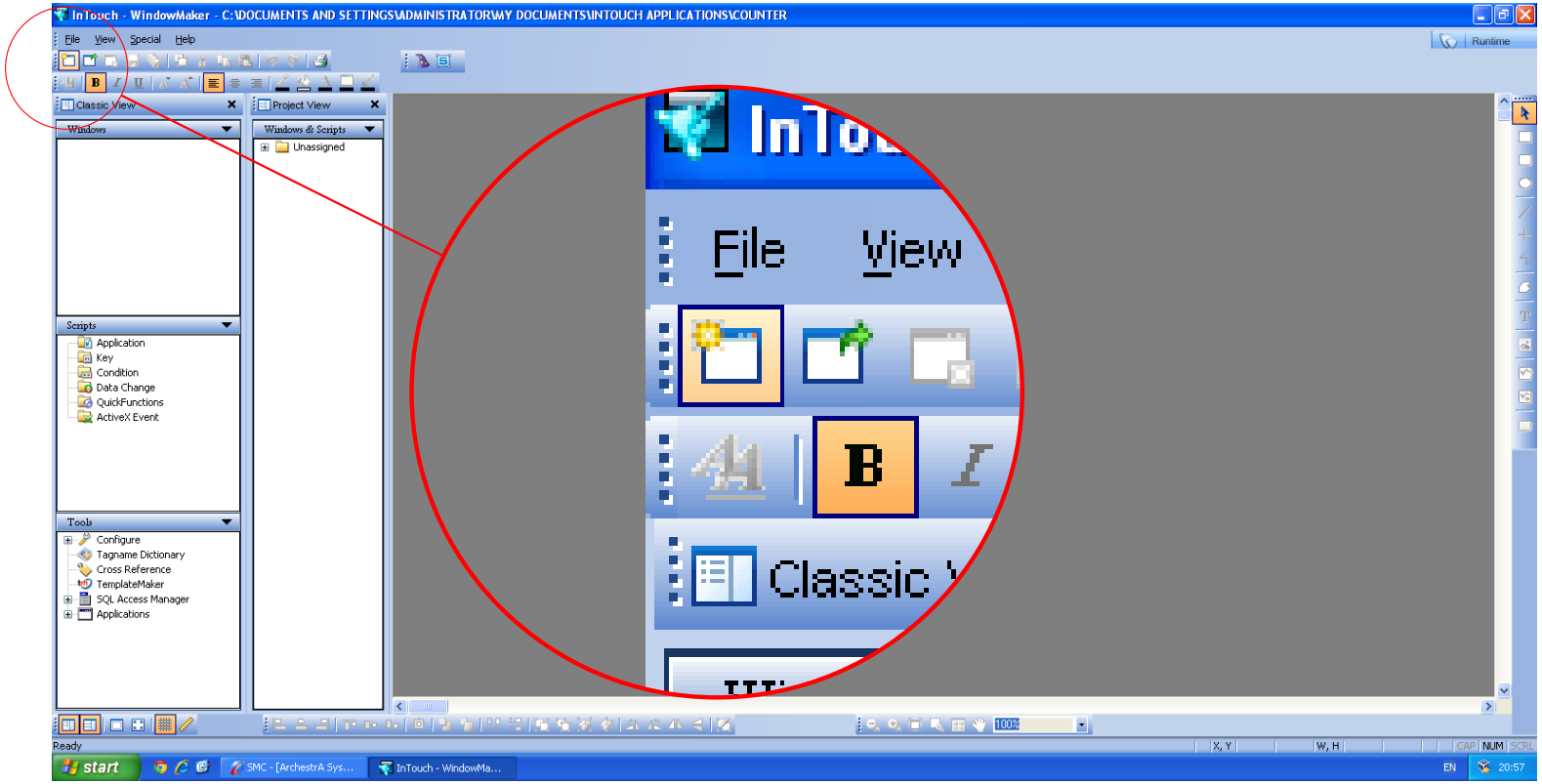

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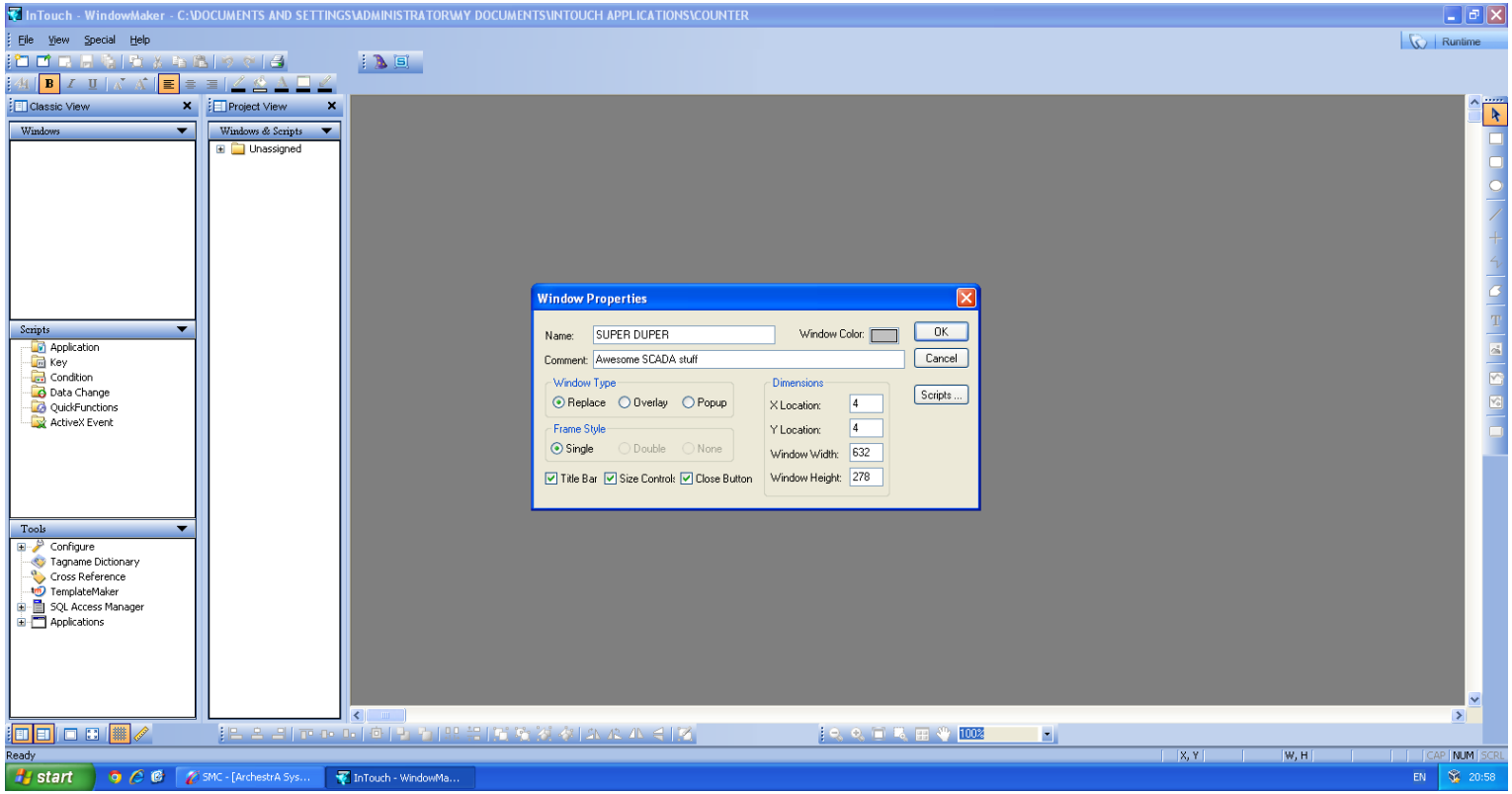

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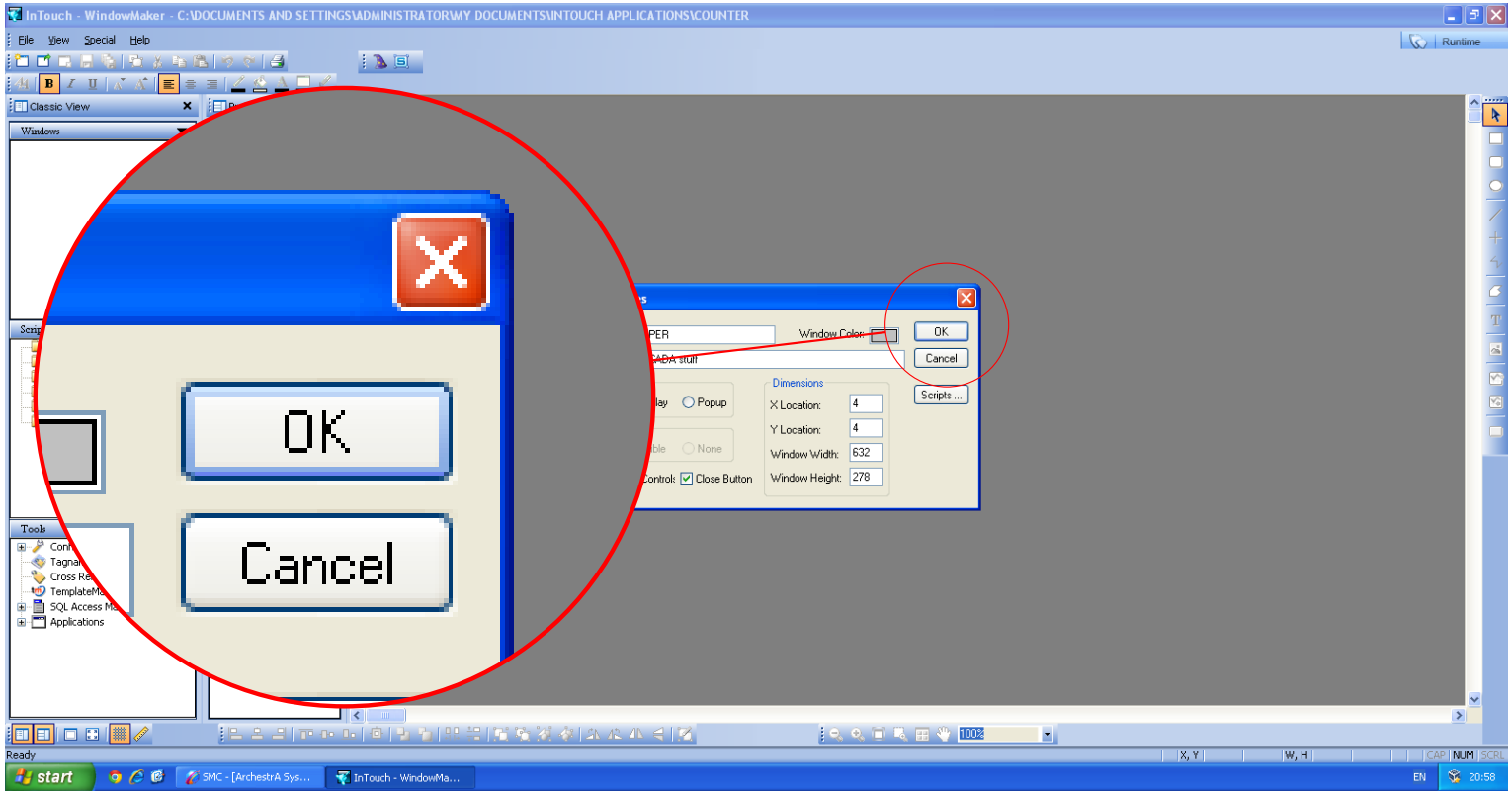

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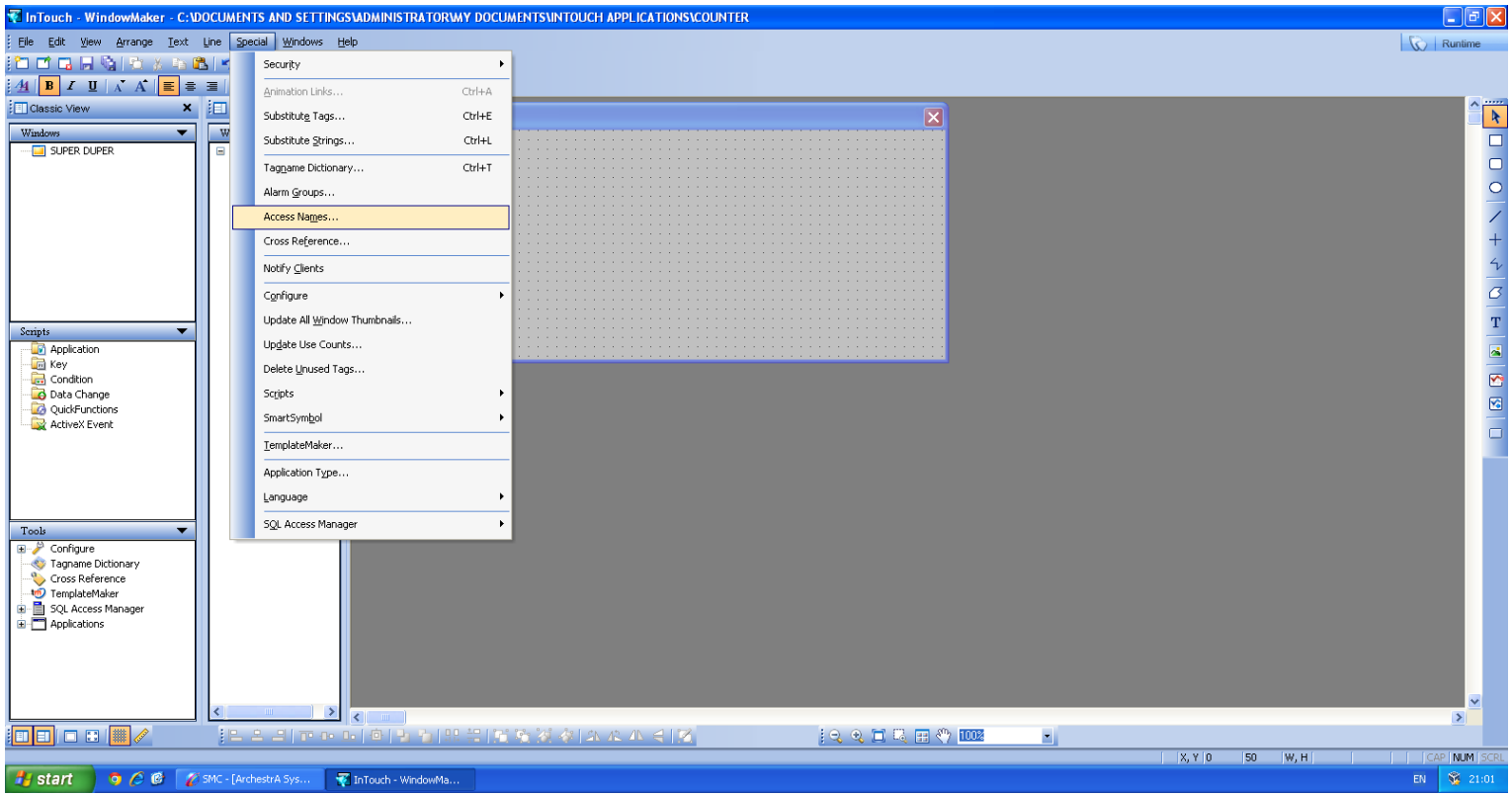

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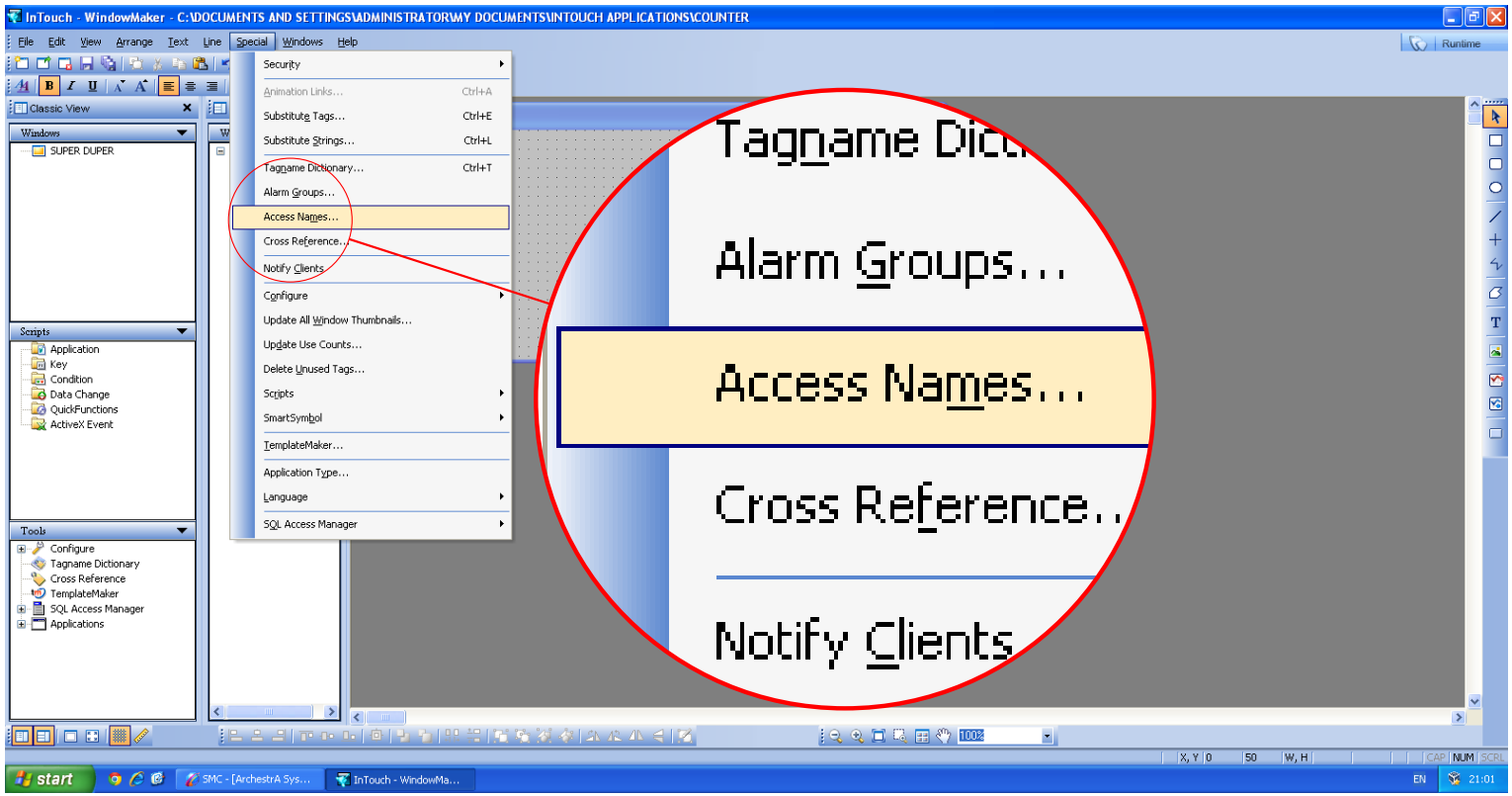

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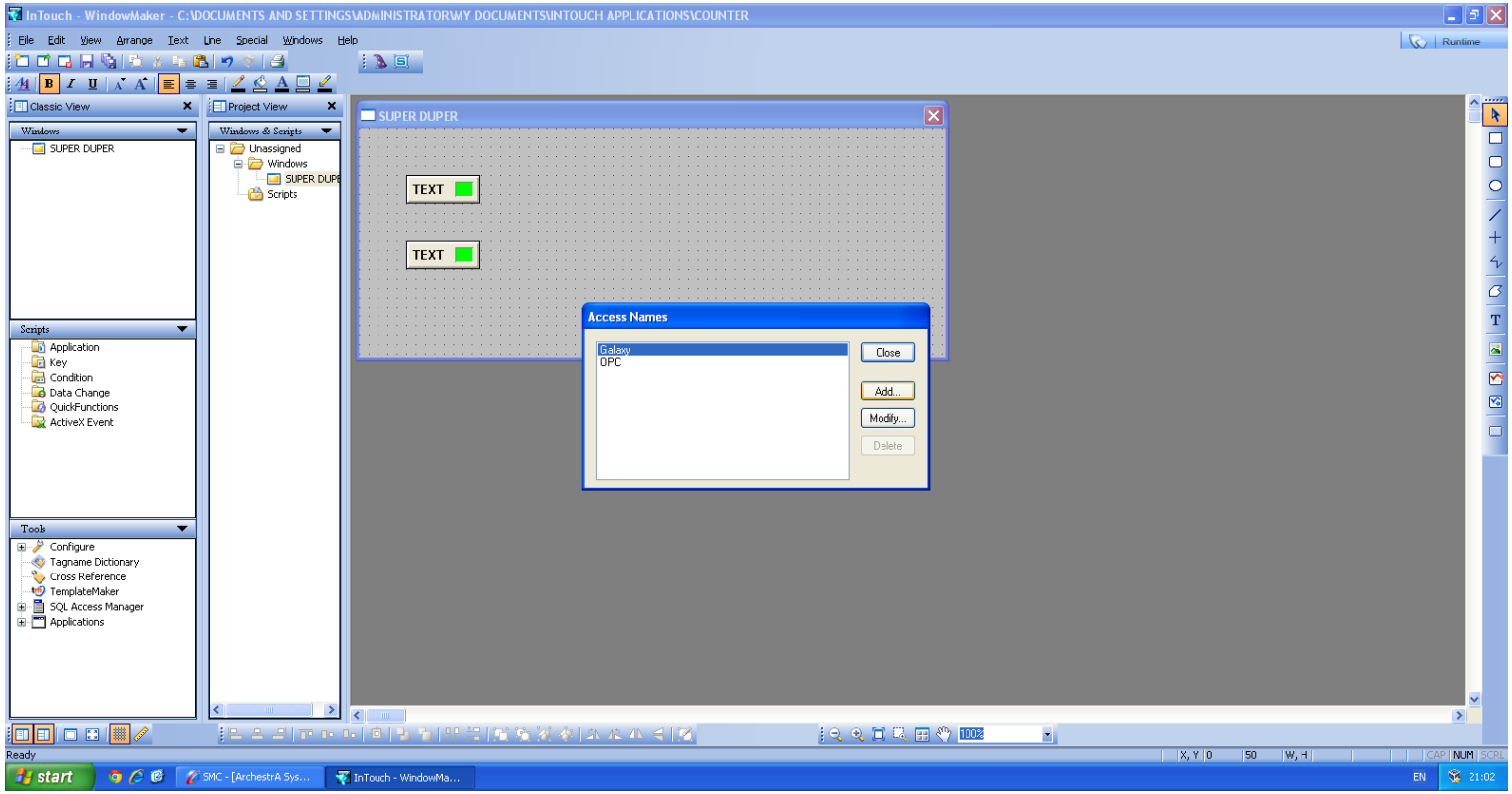

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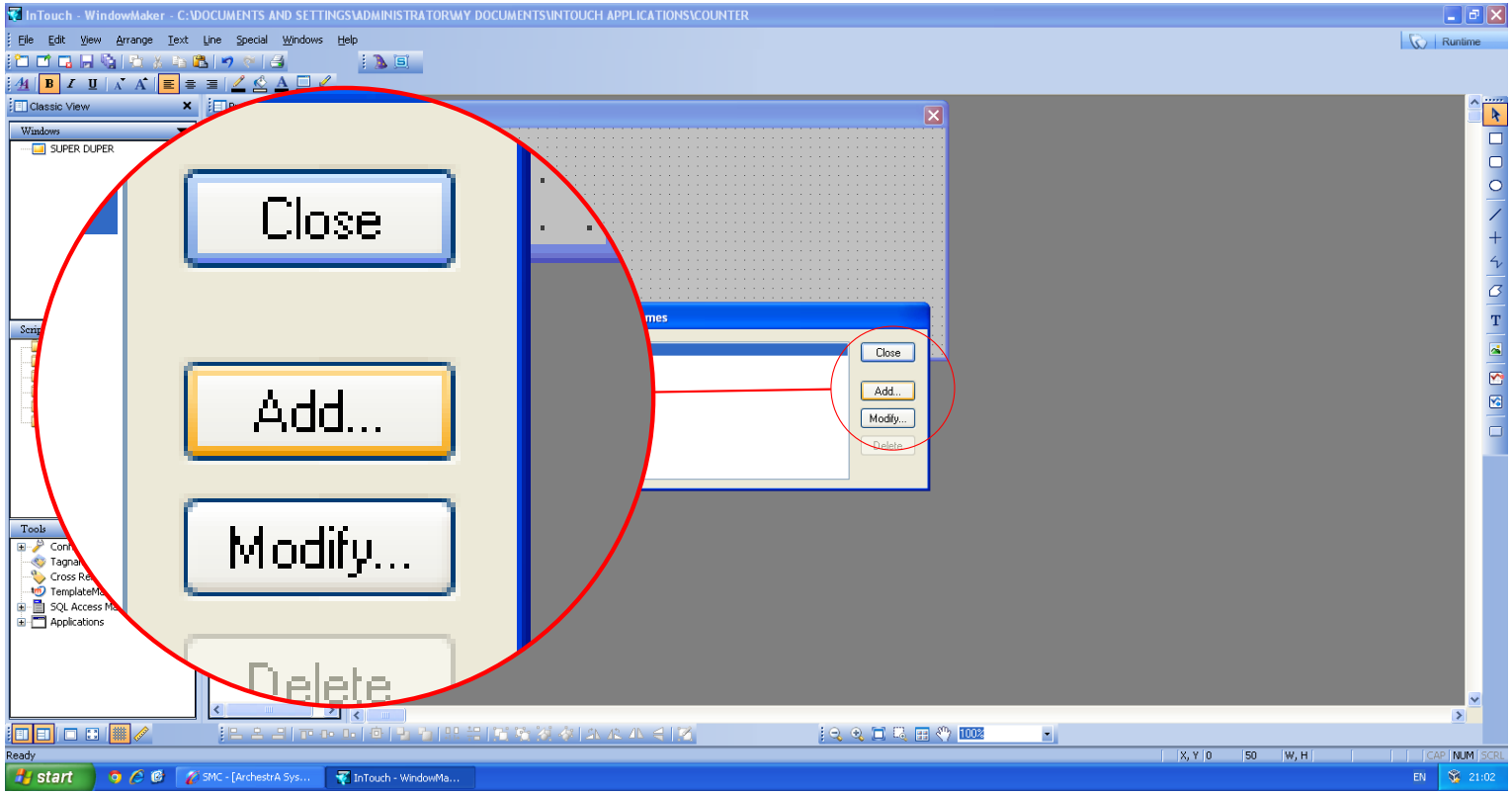

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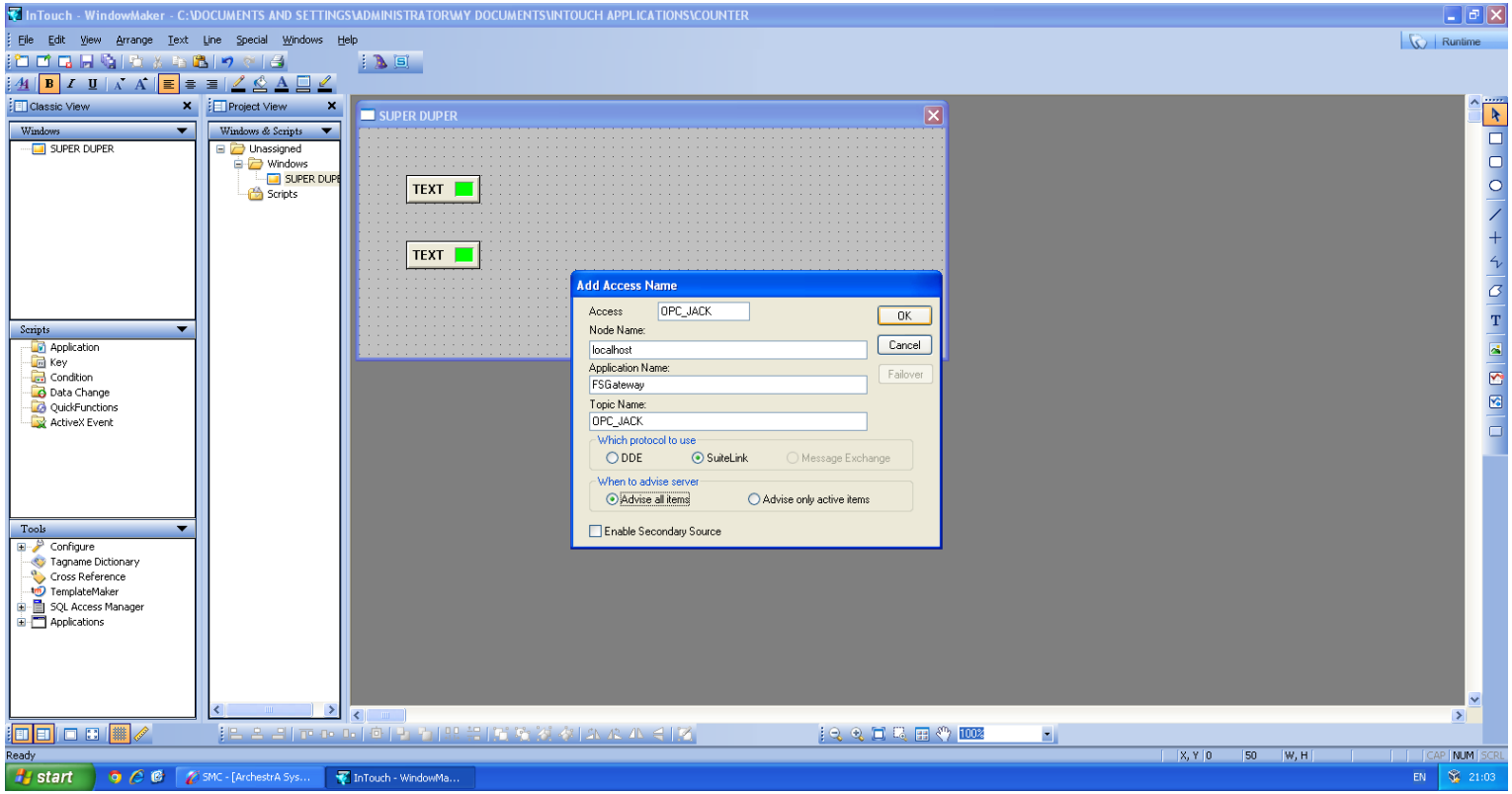

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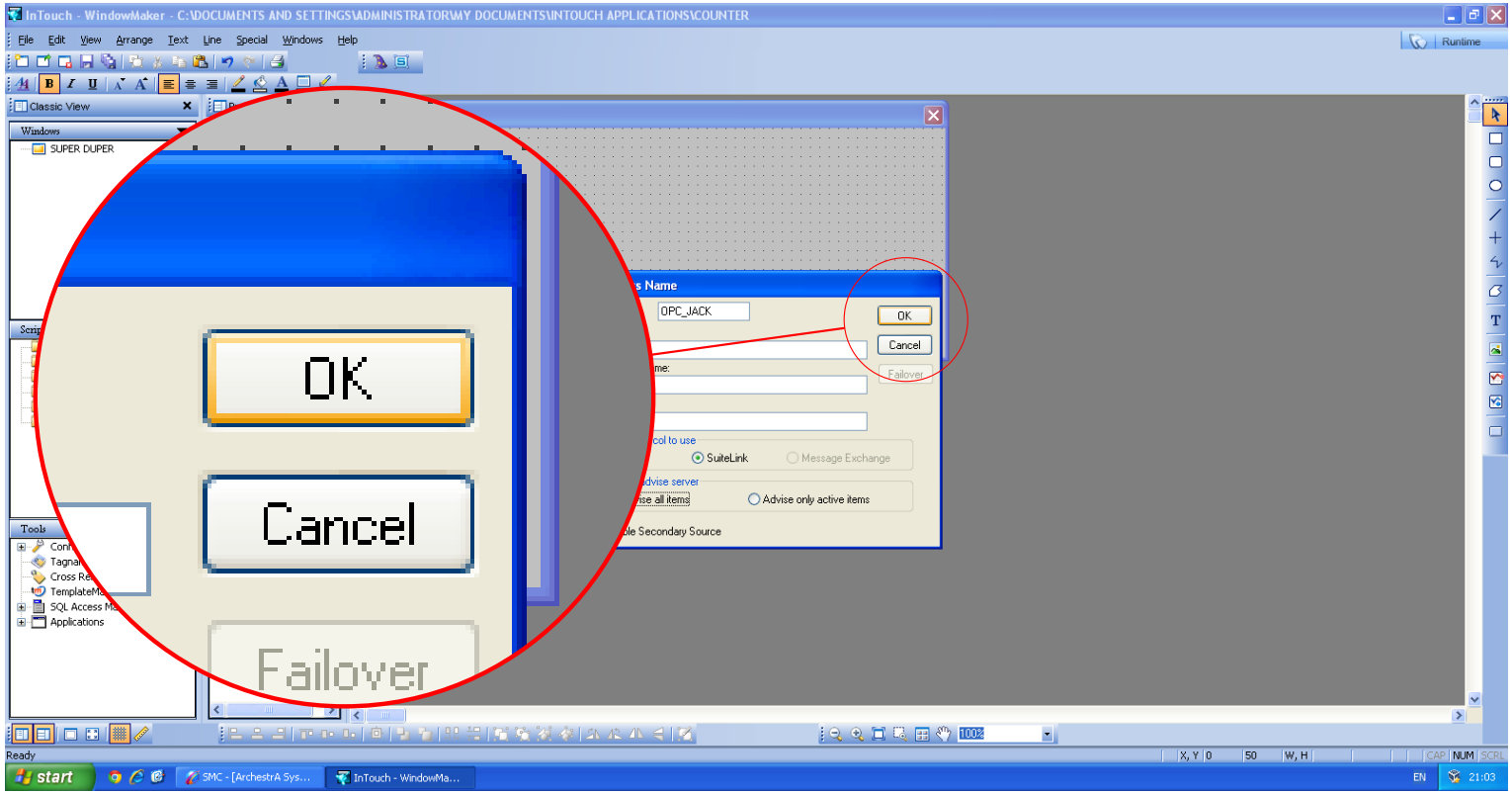

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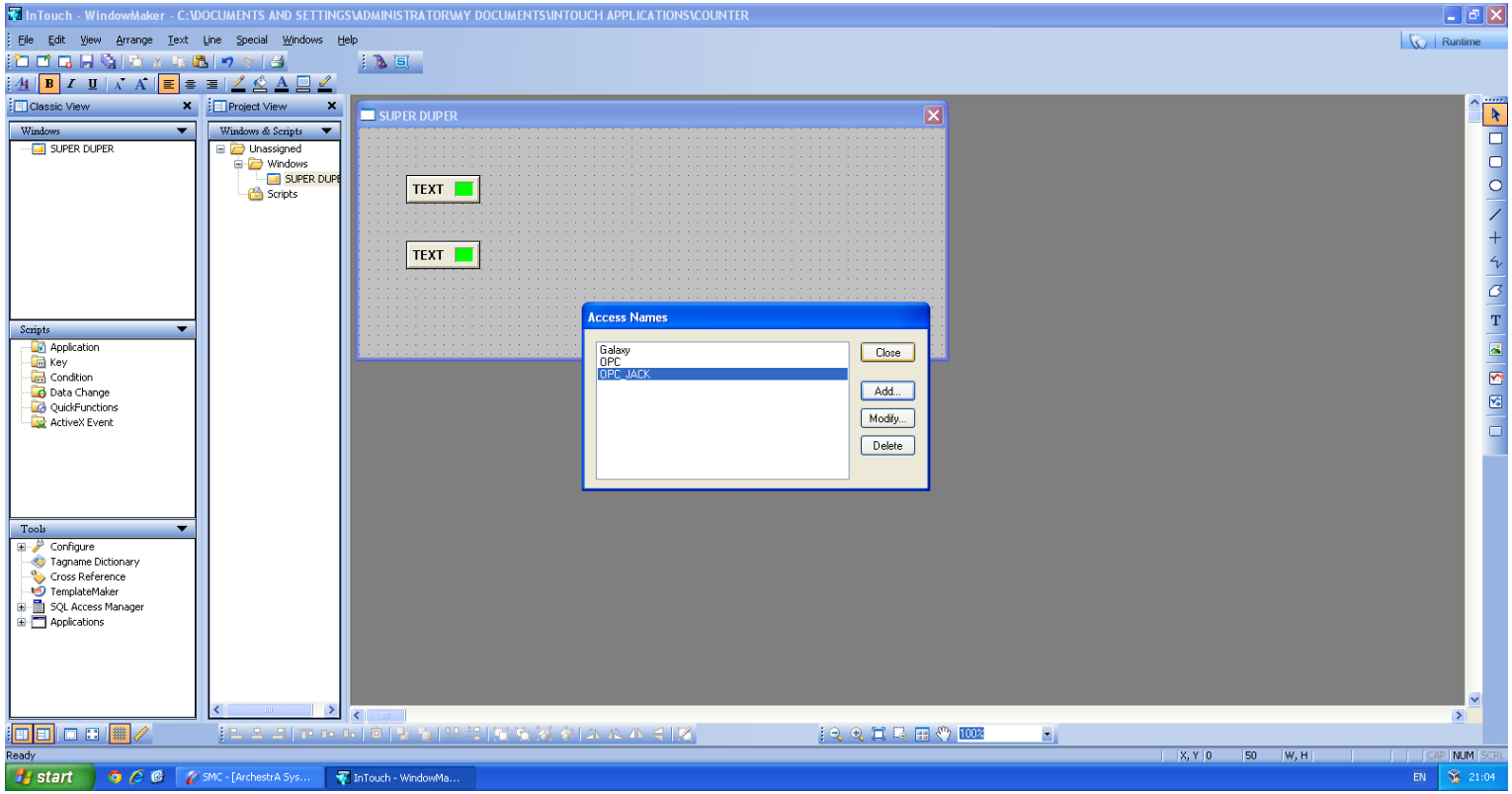

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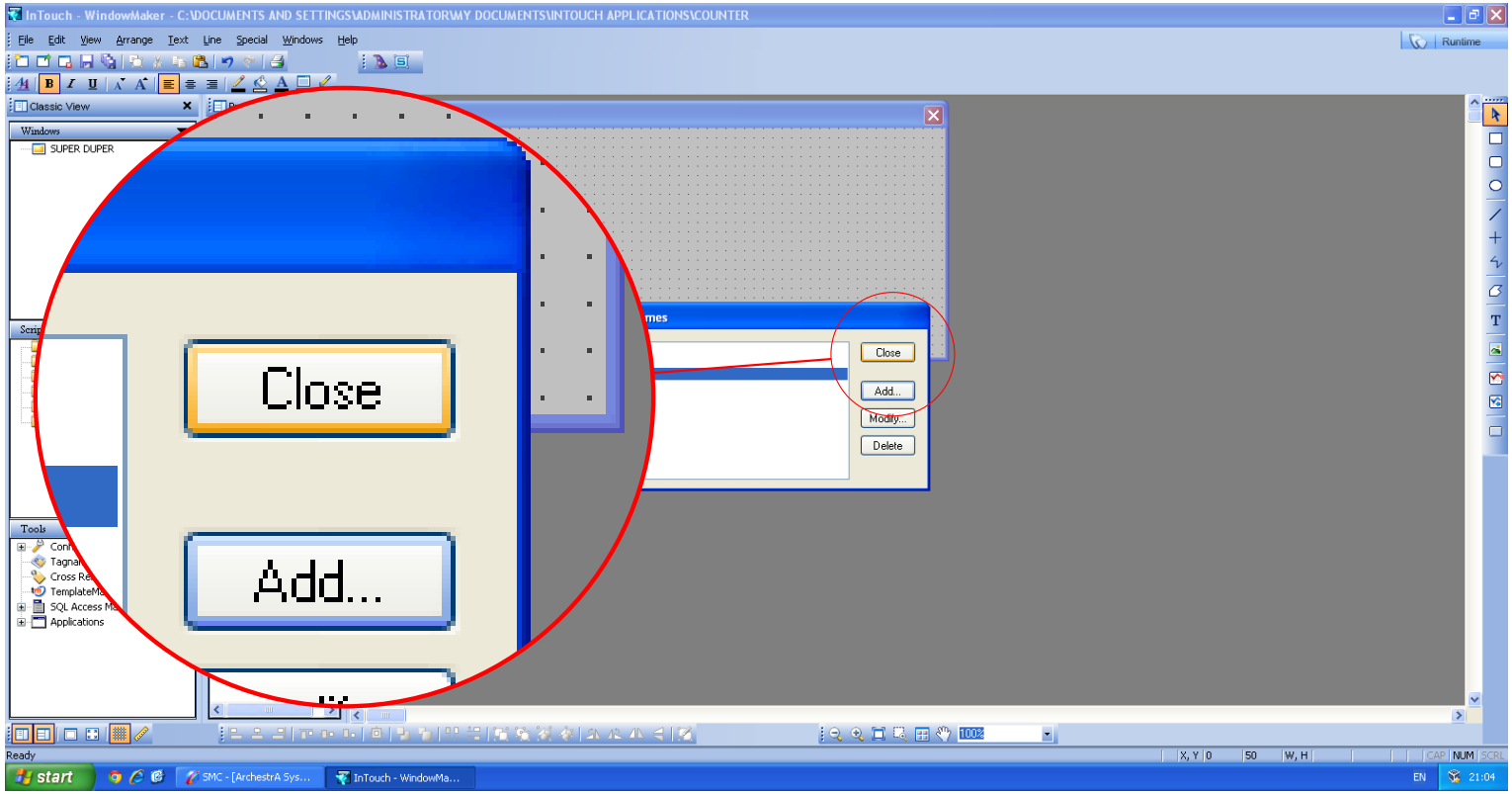
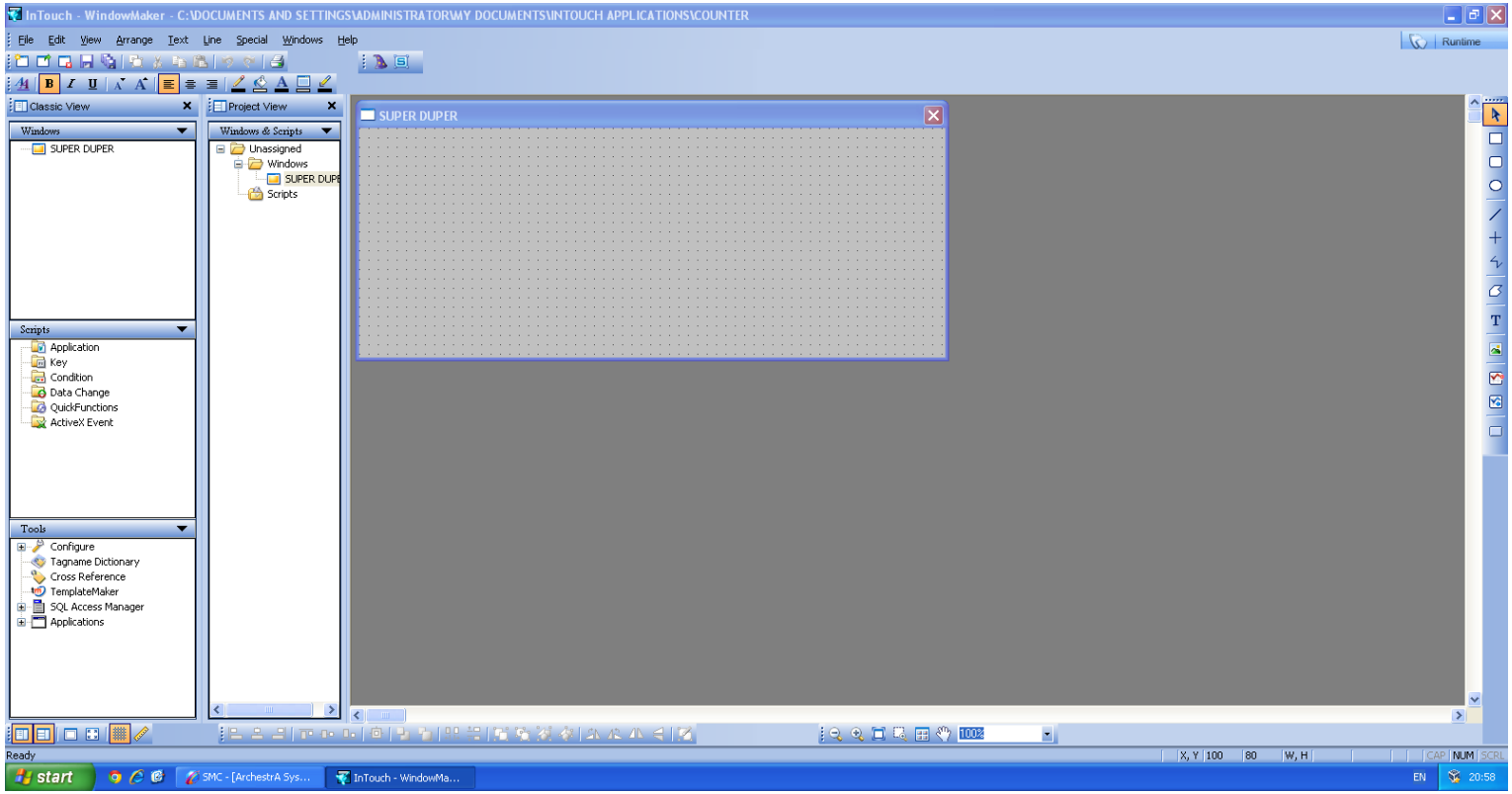


inTouch: create buttons and meters



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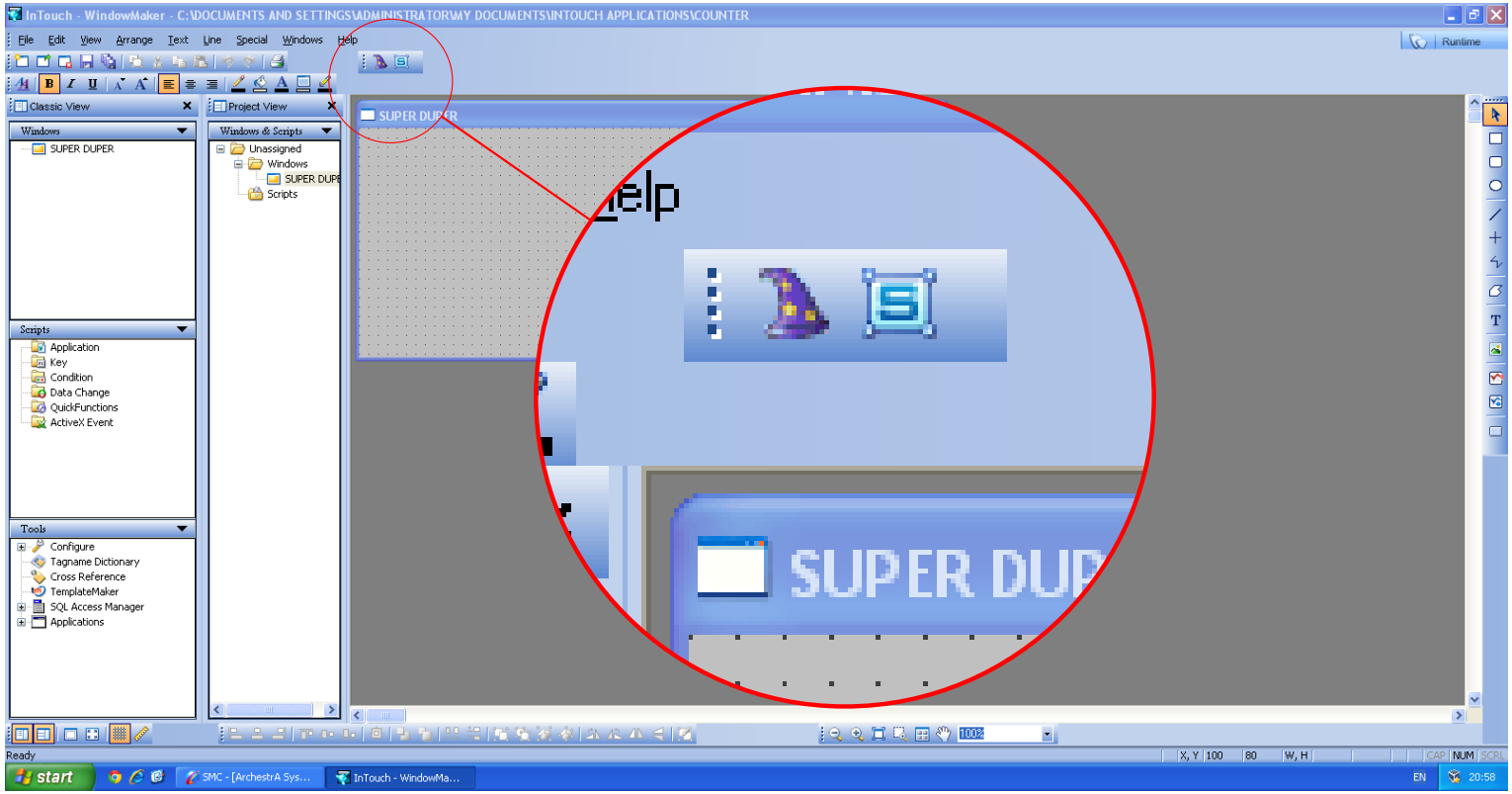

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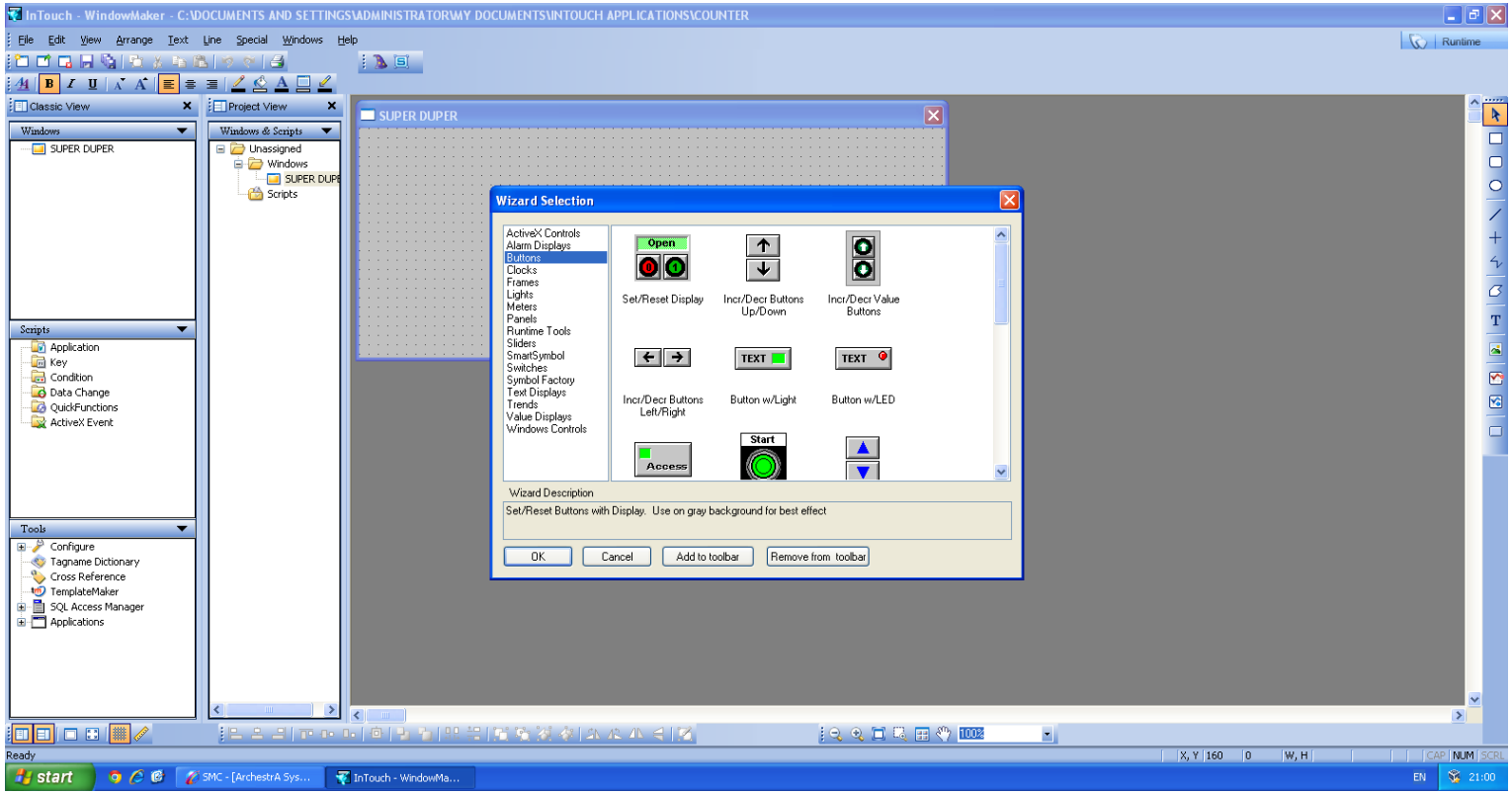

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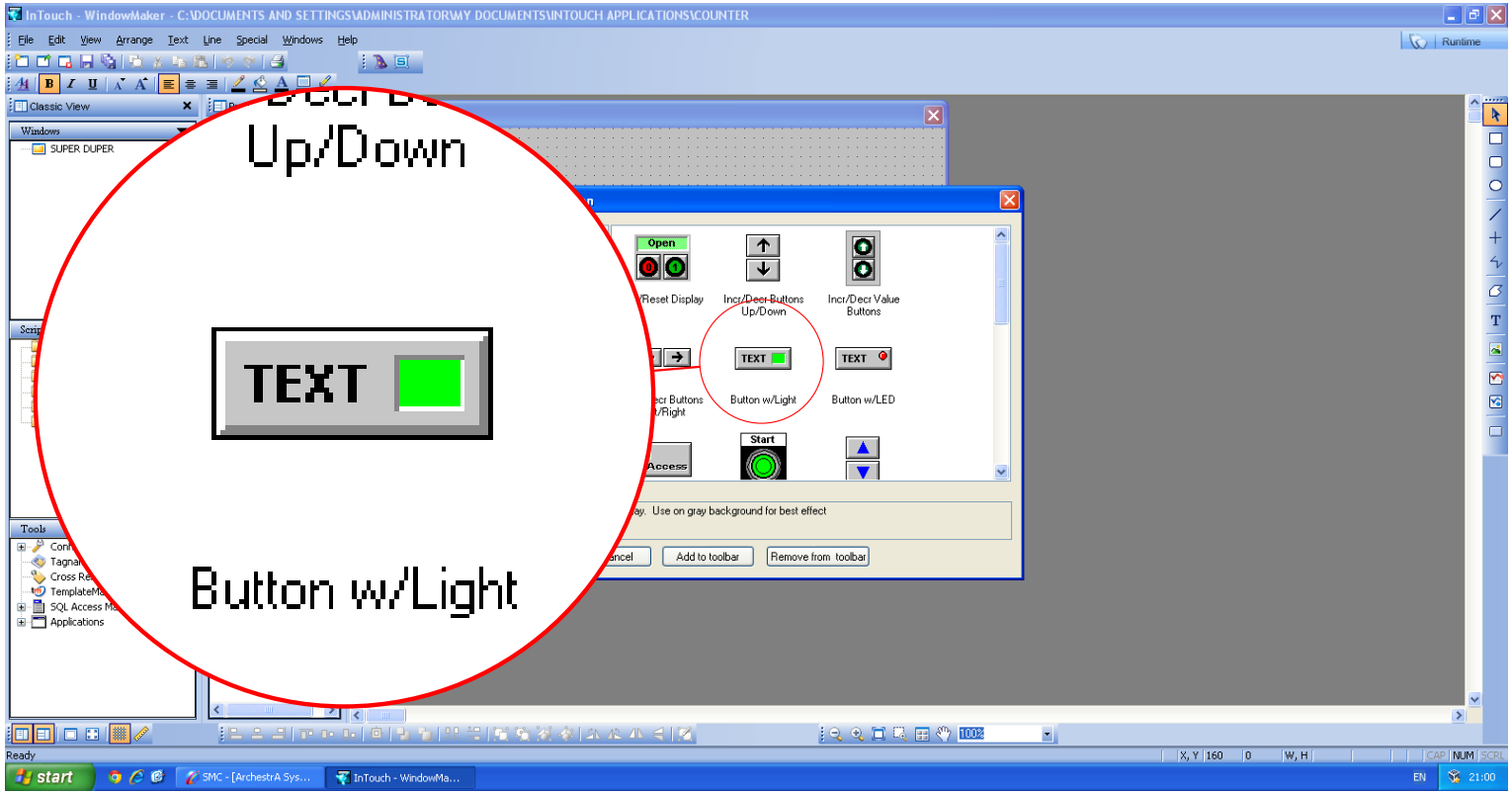

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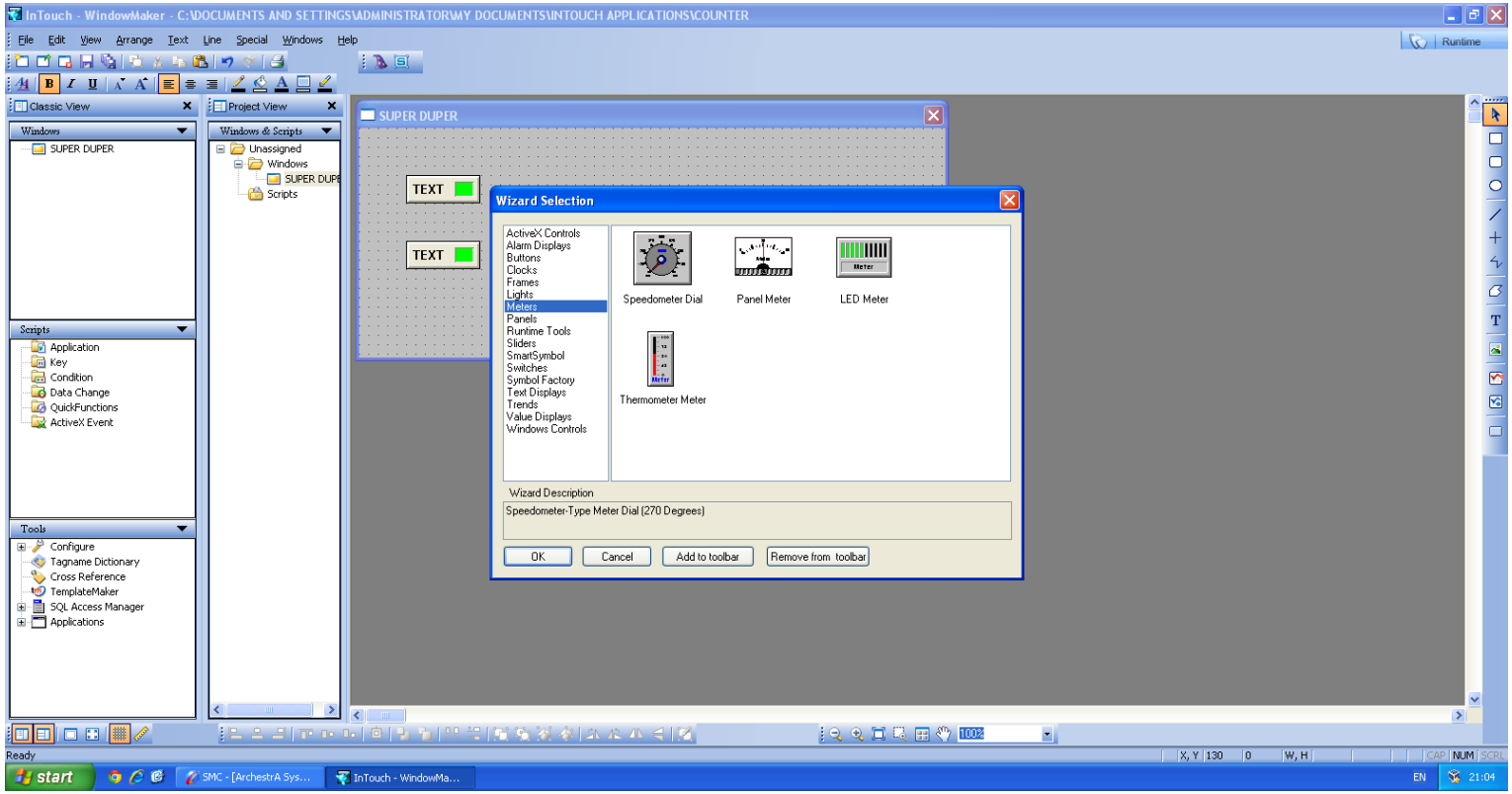

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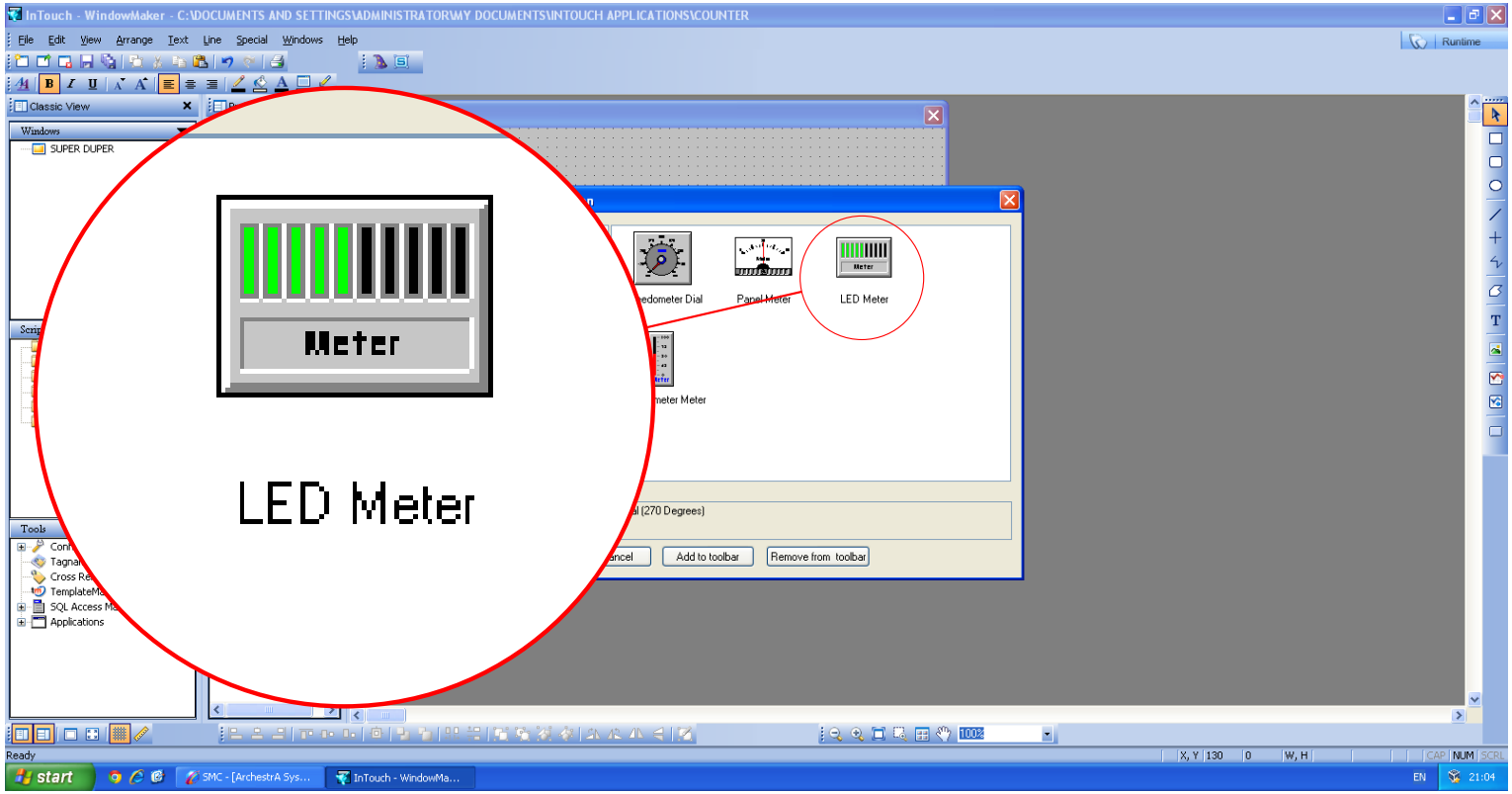

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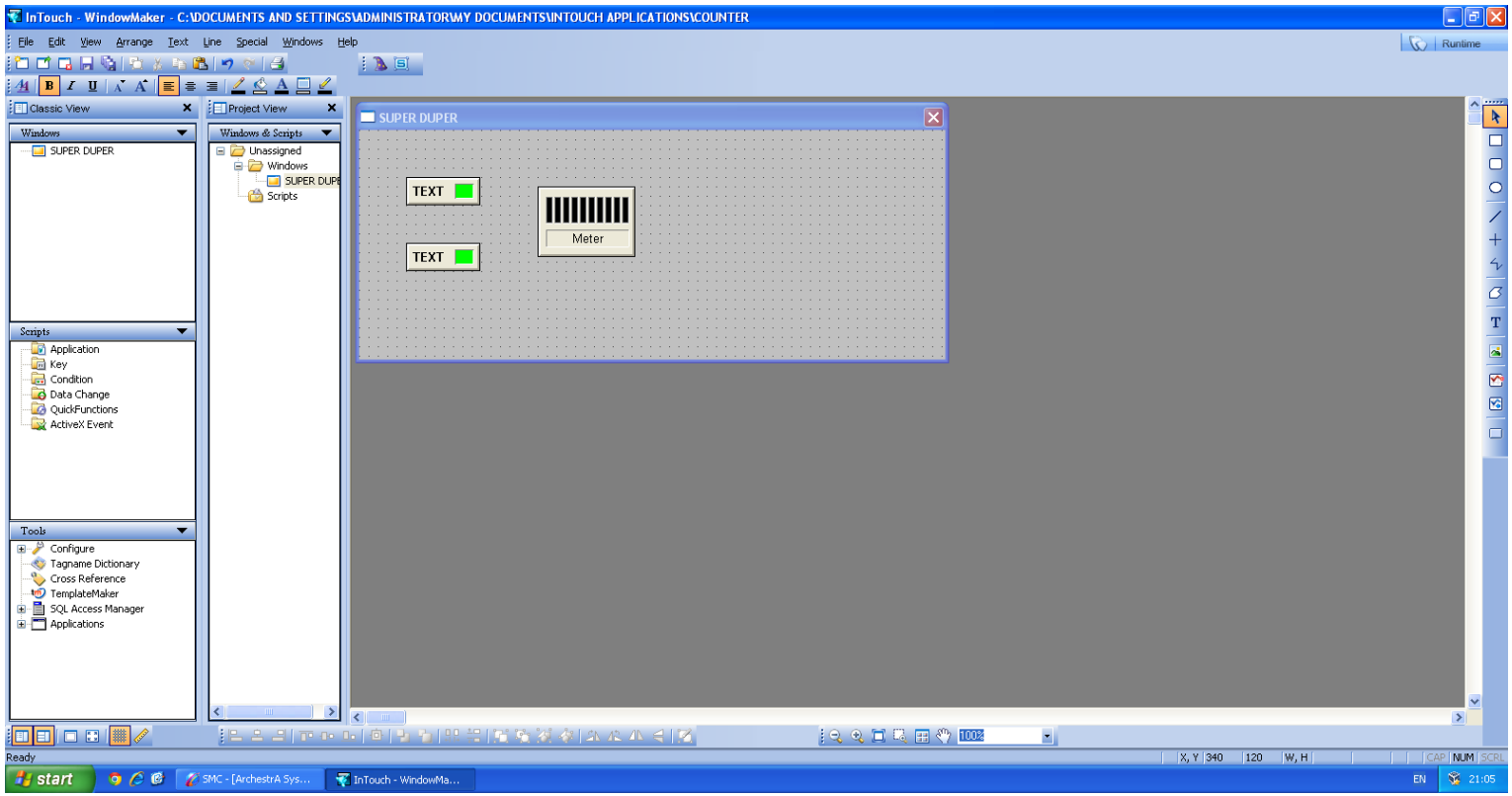
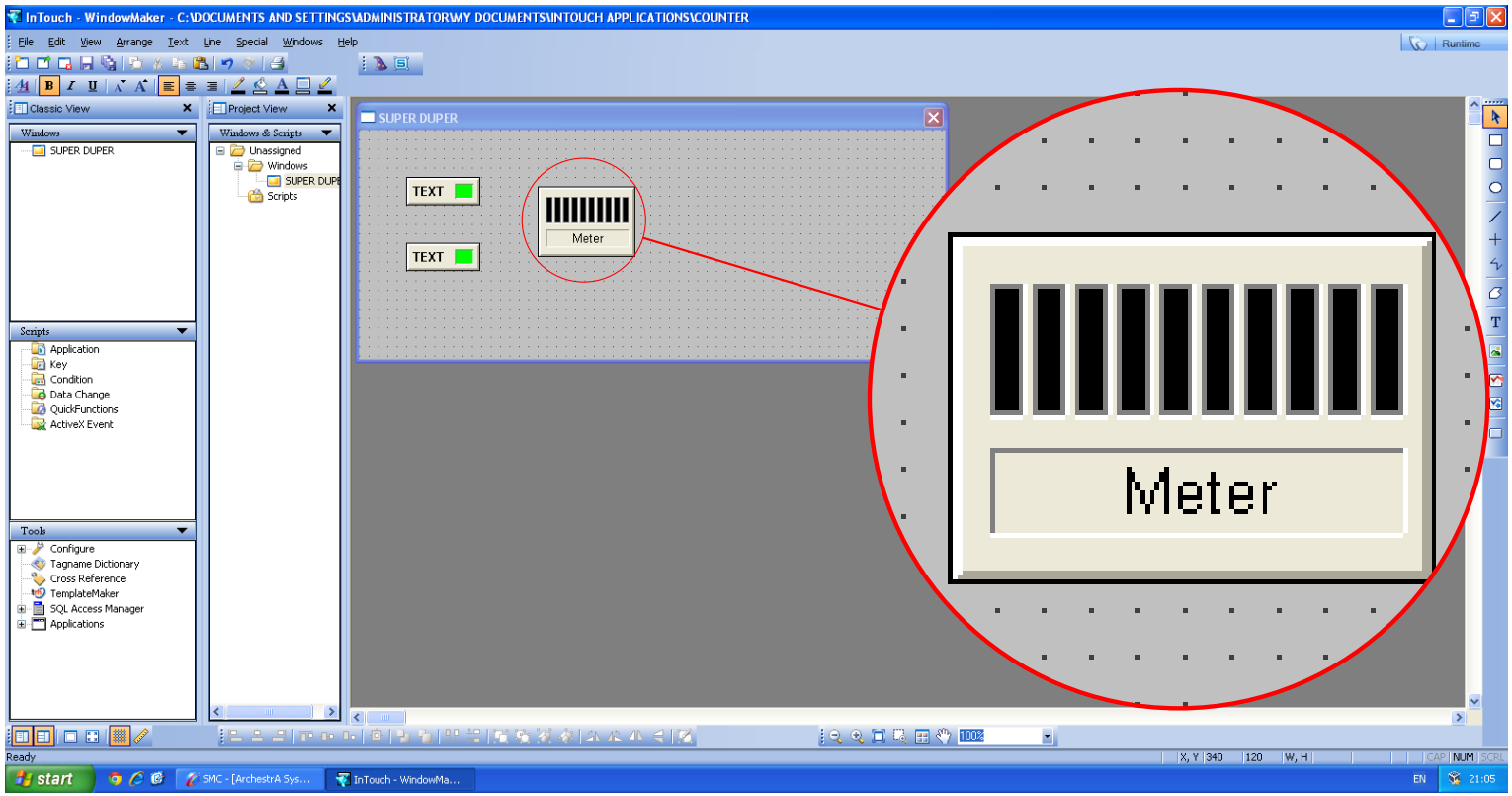


inTouch: create buttons and meters



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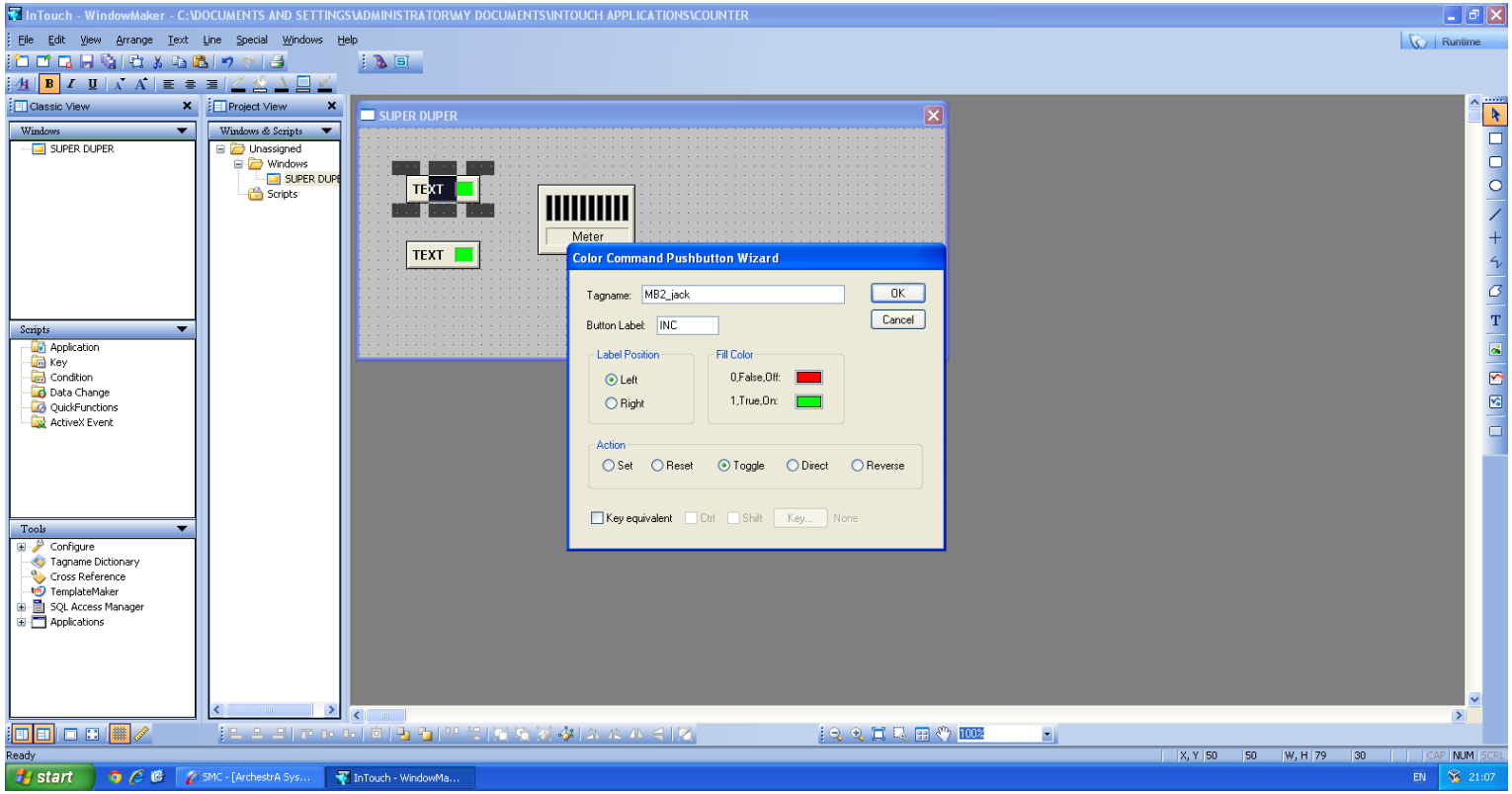
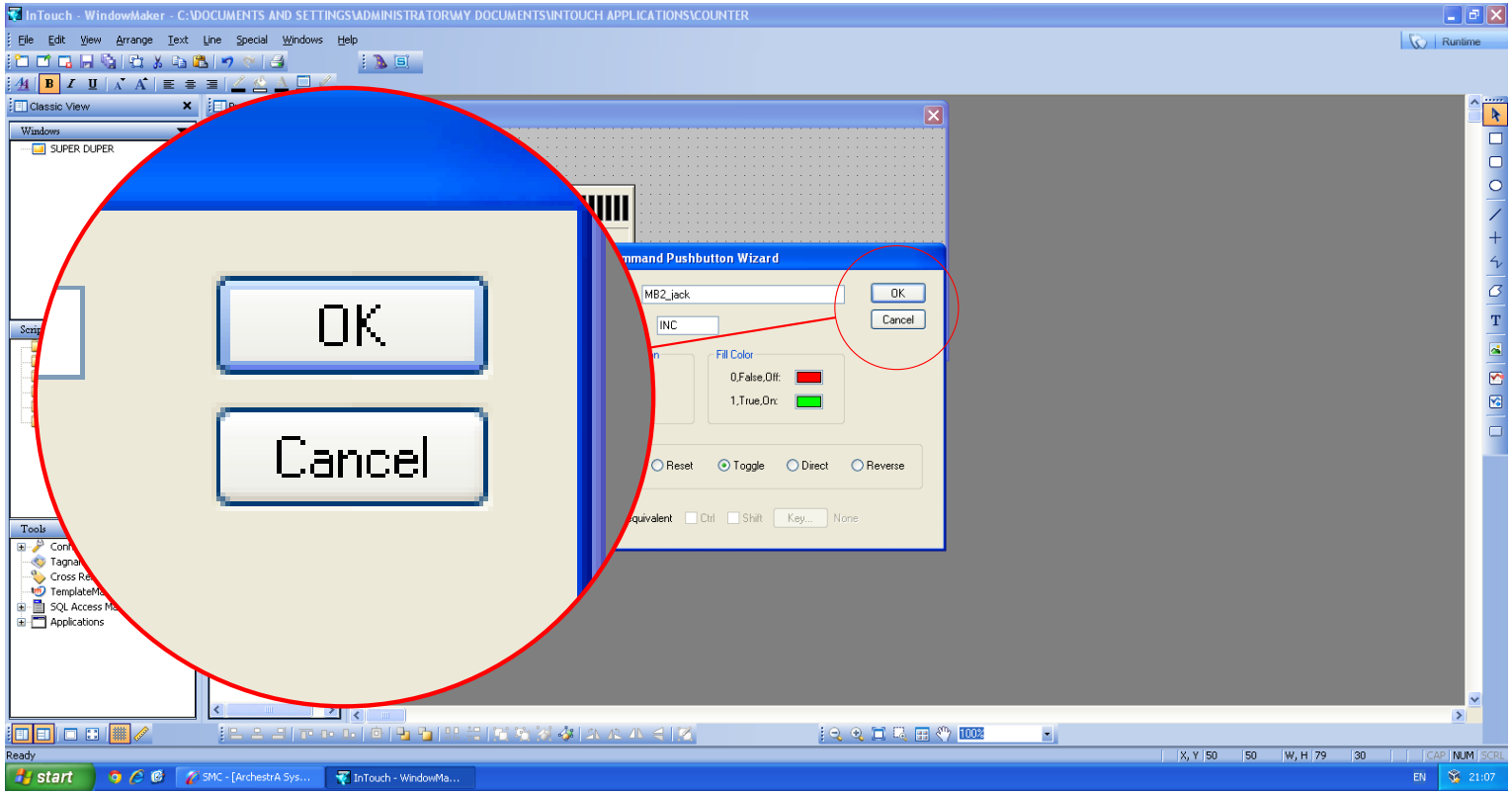


inTouch: create buttons and meters



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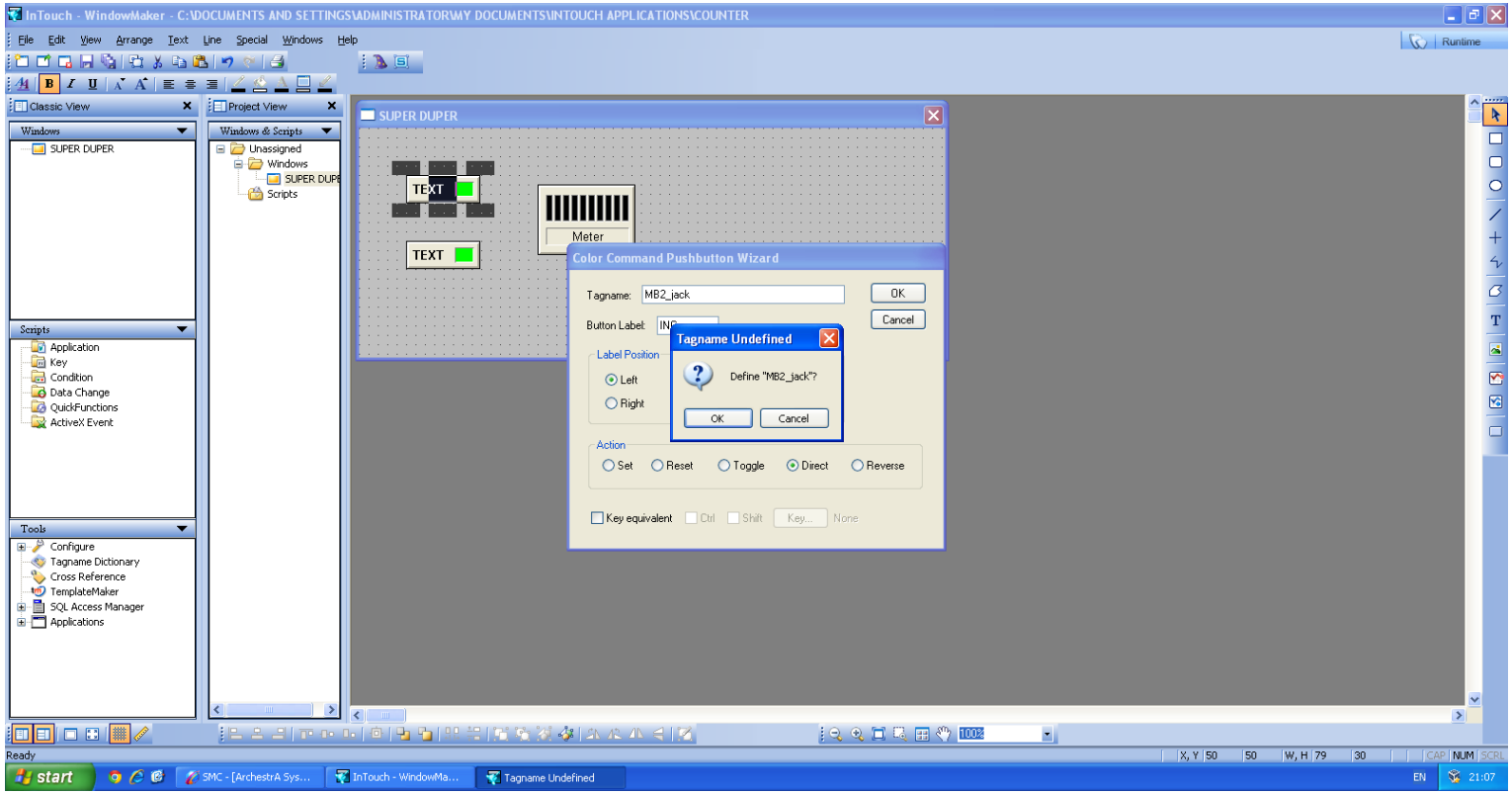

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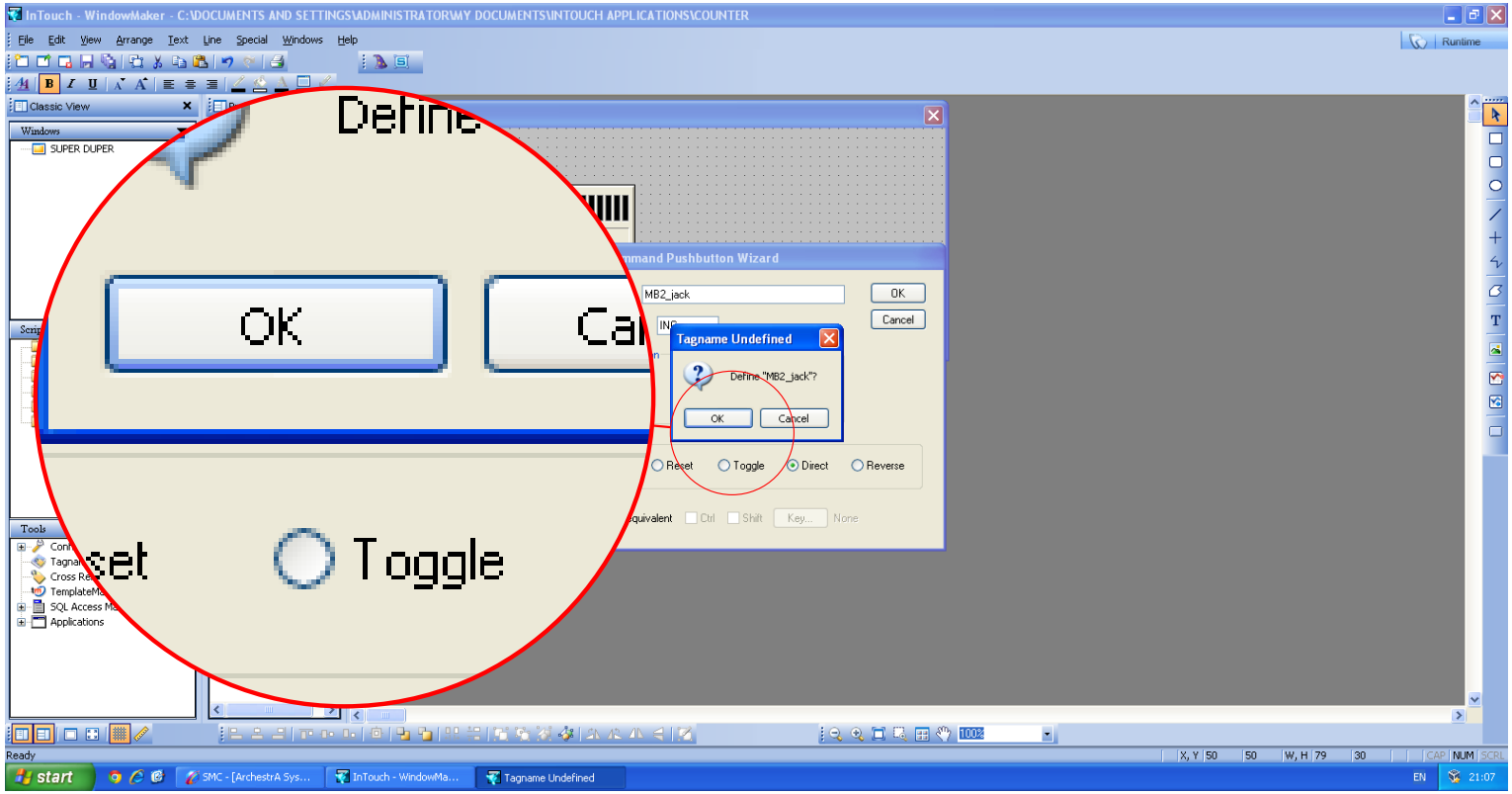

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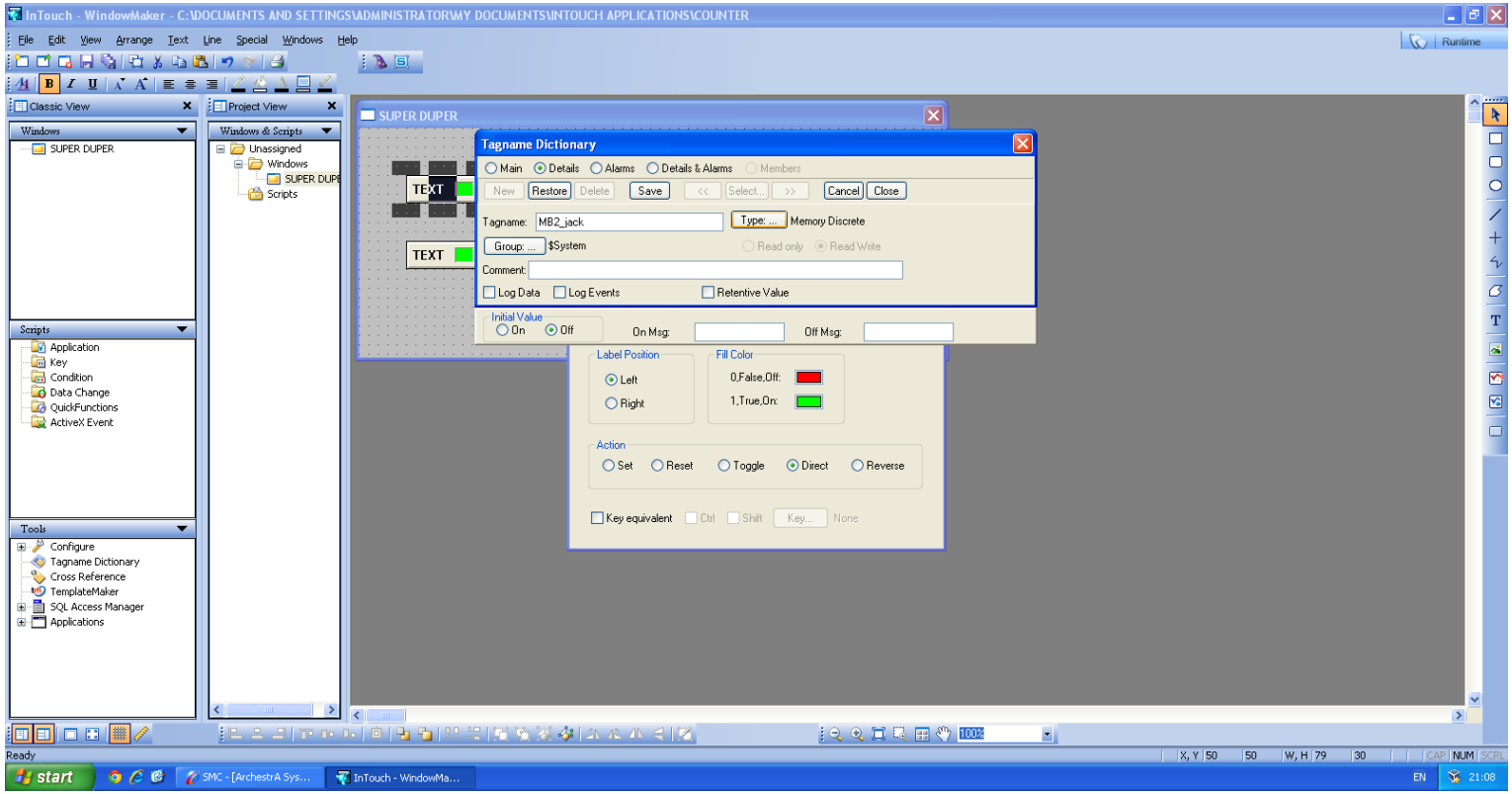

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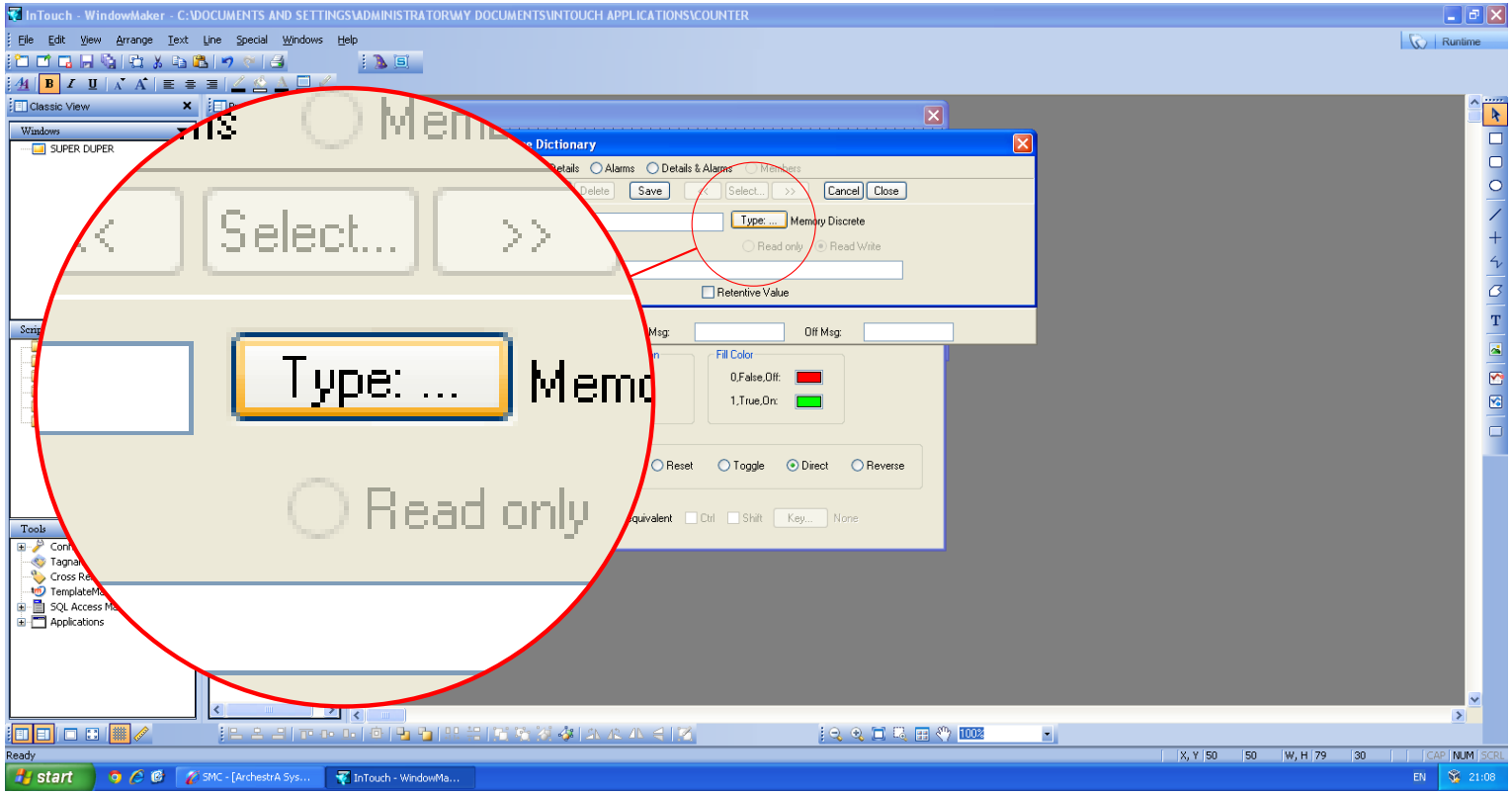

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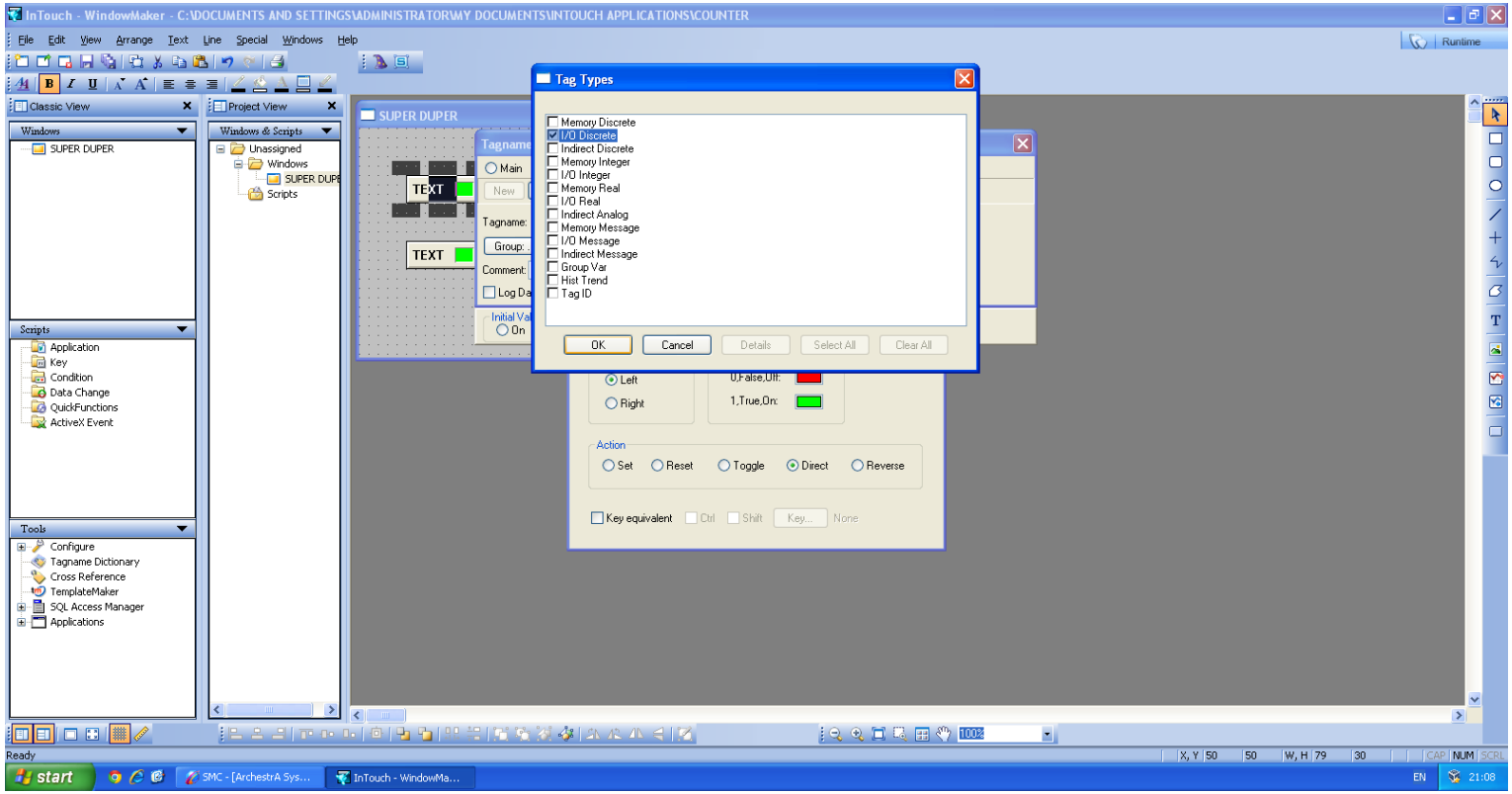
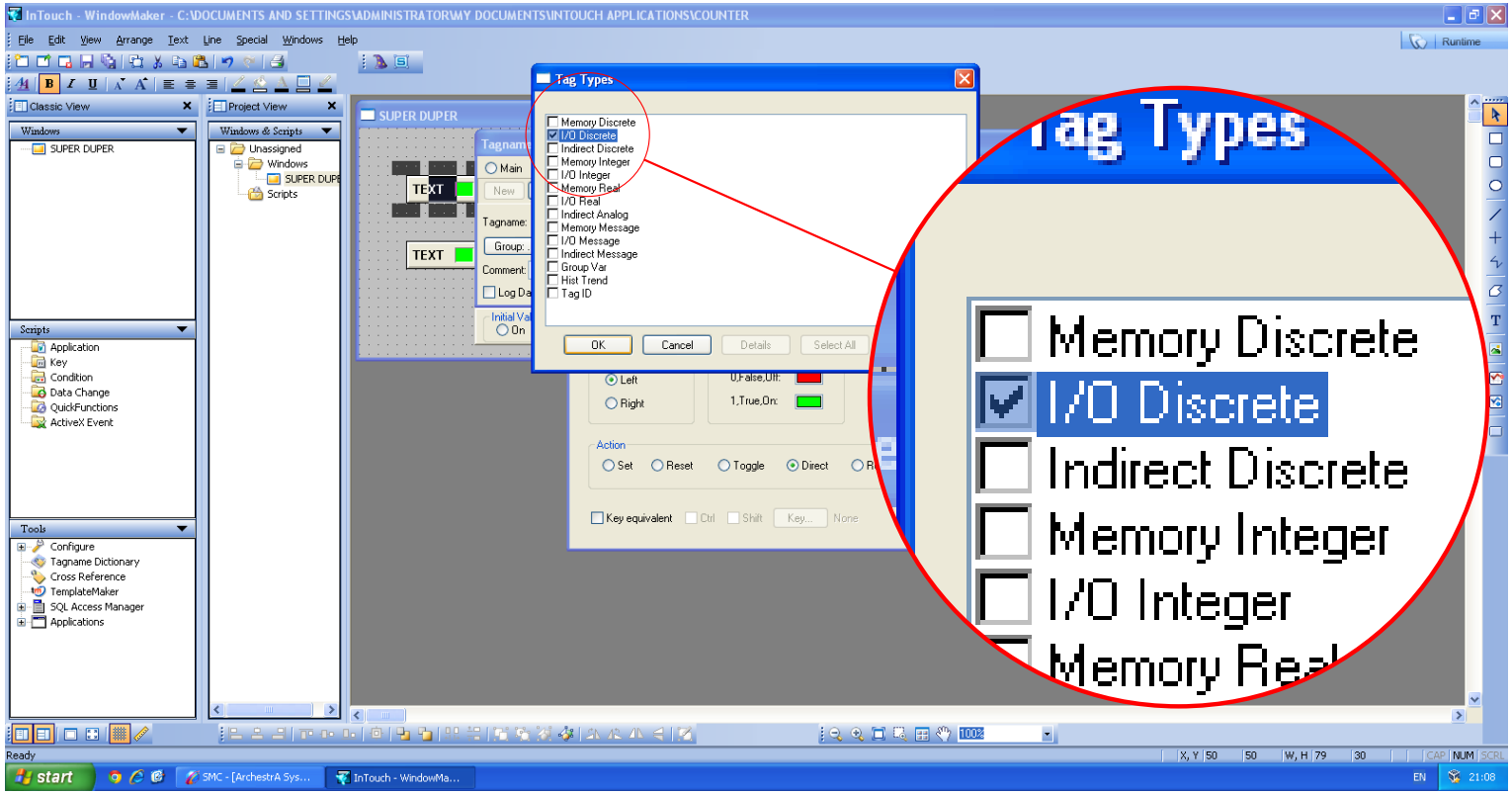
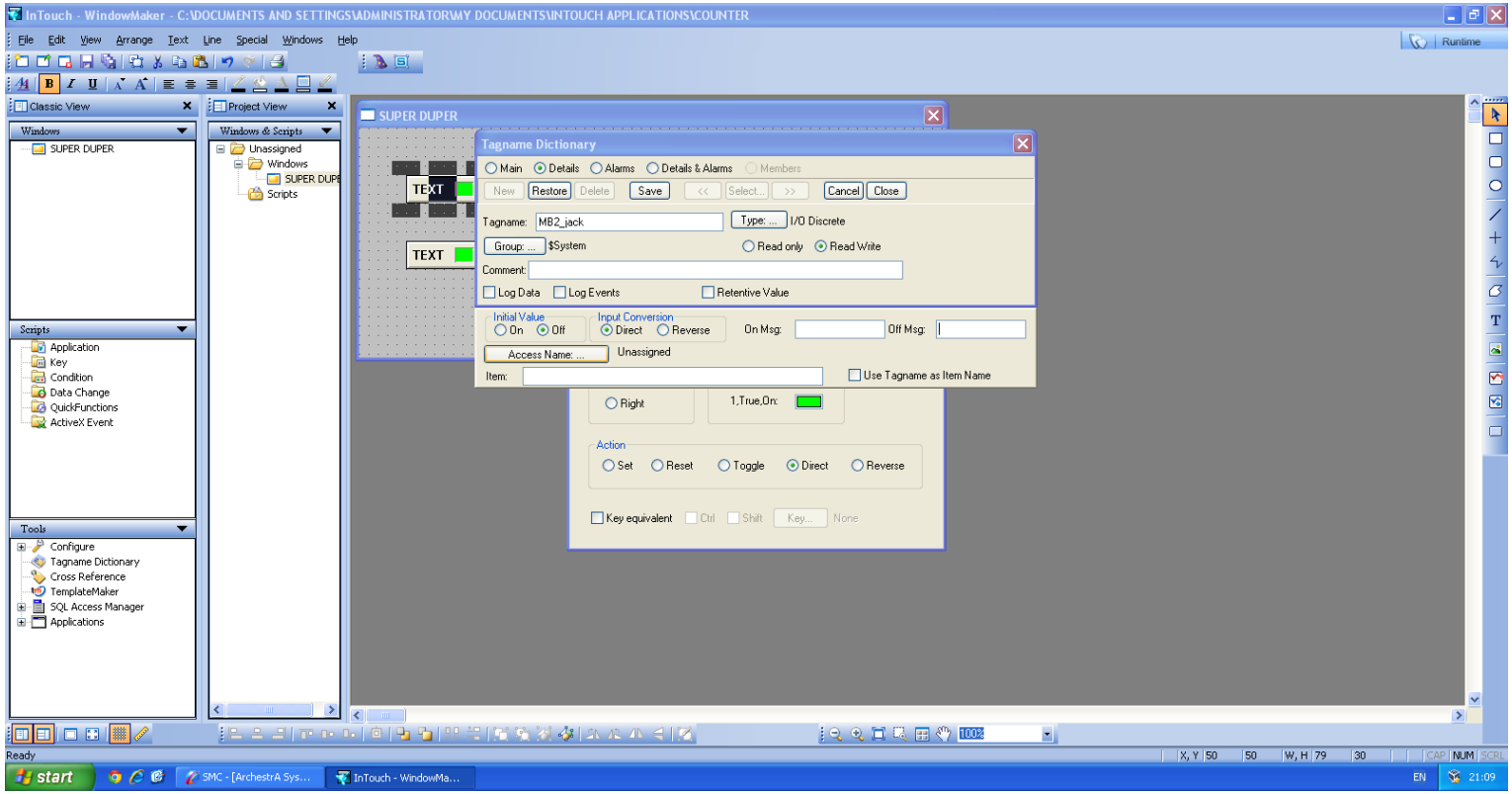


inTouch: create tags (1)



inTouch: create tags (1)



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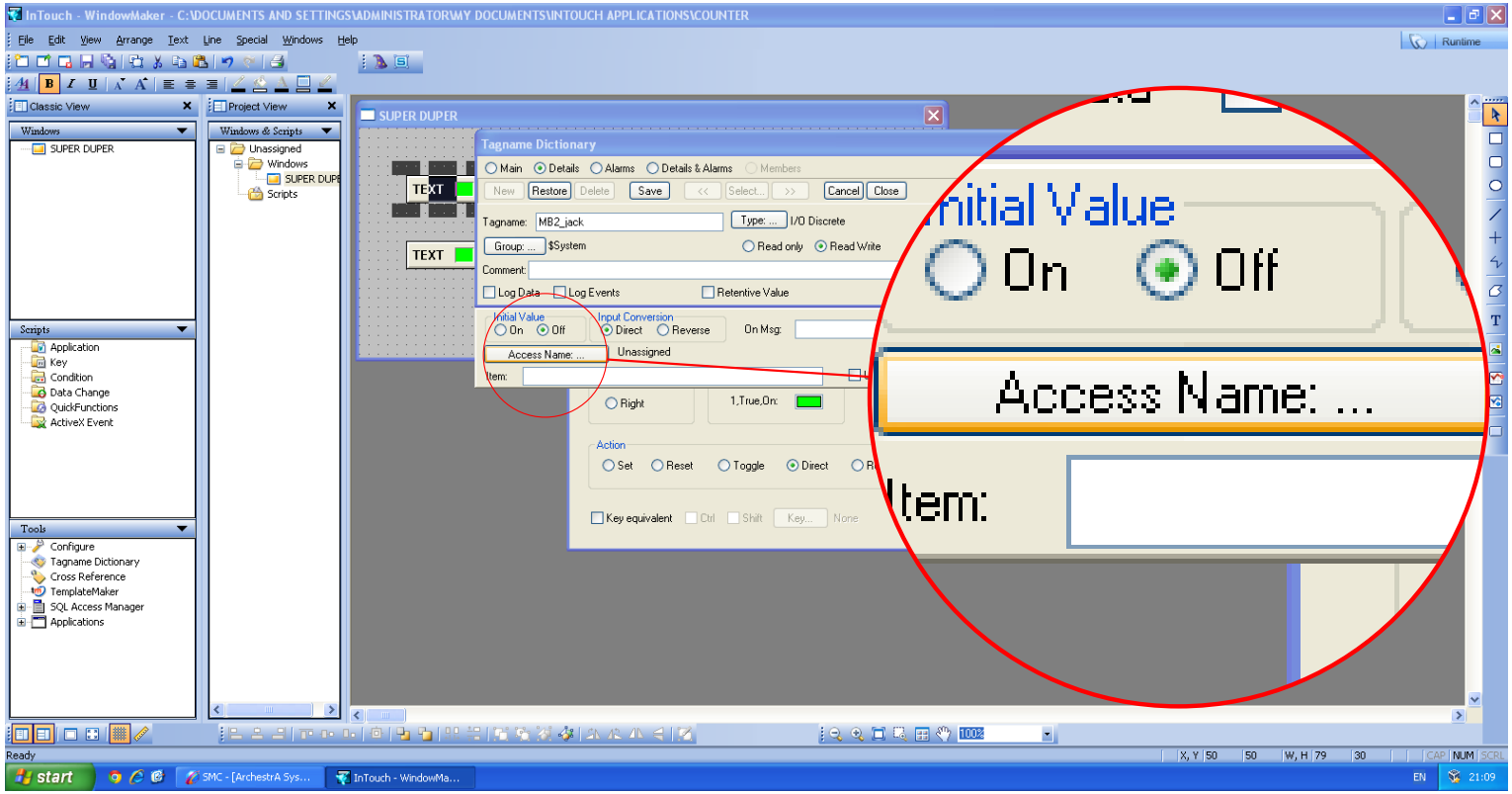

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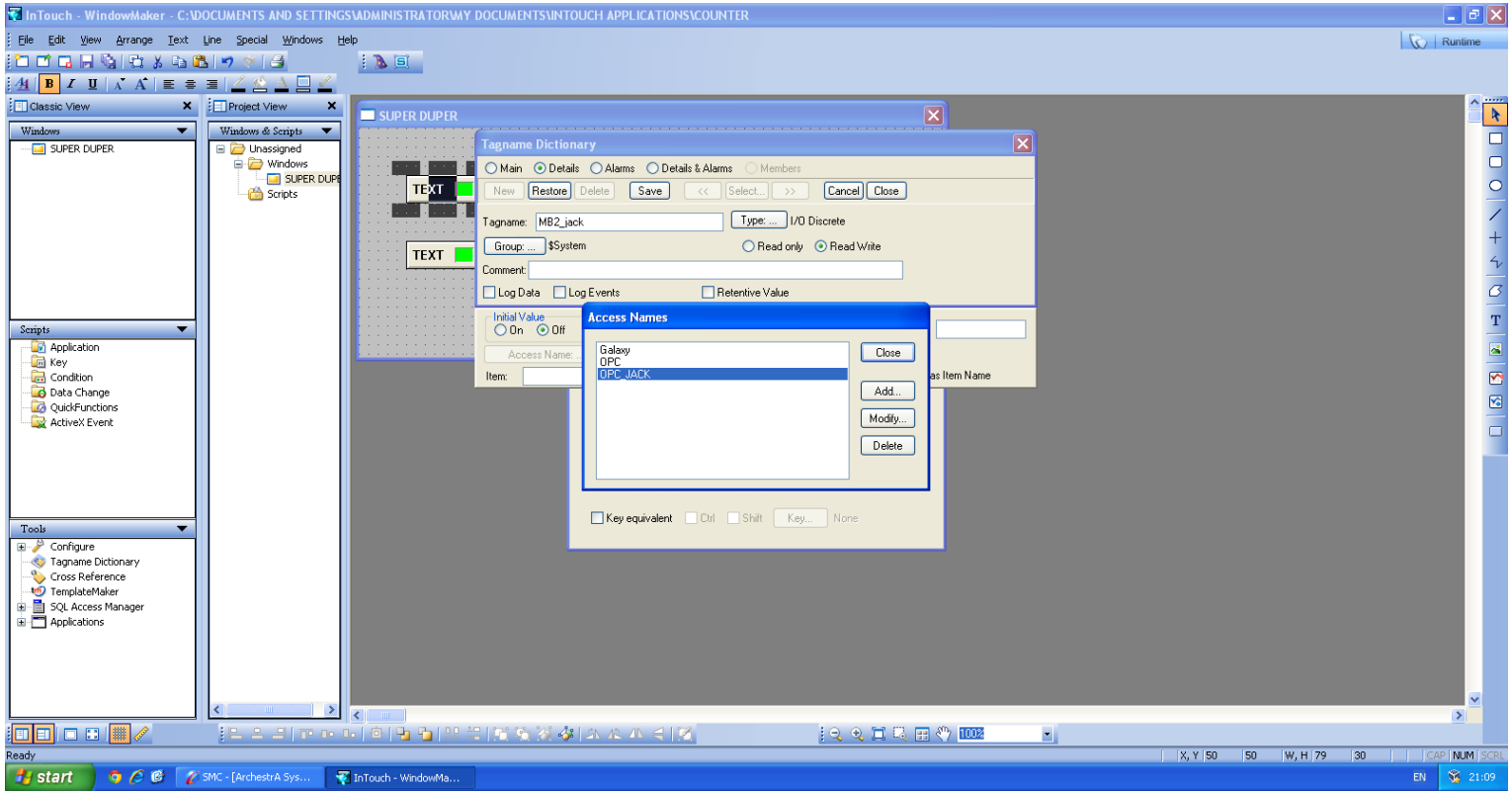

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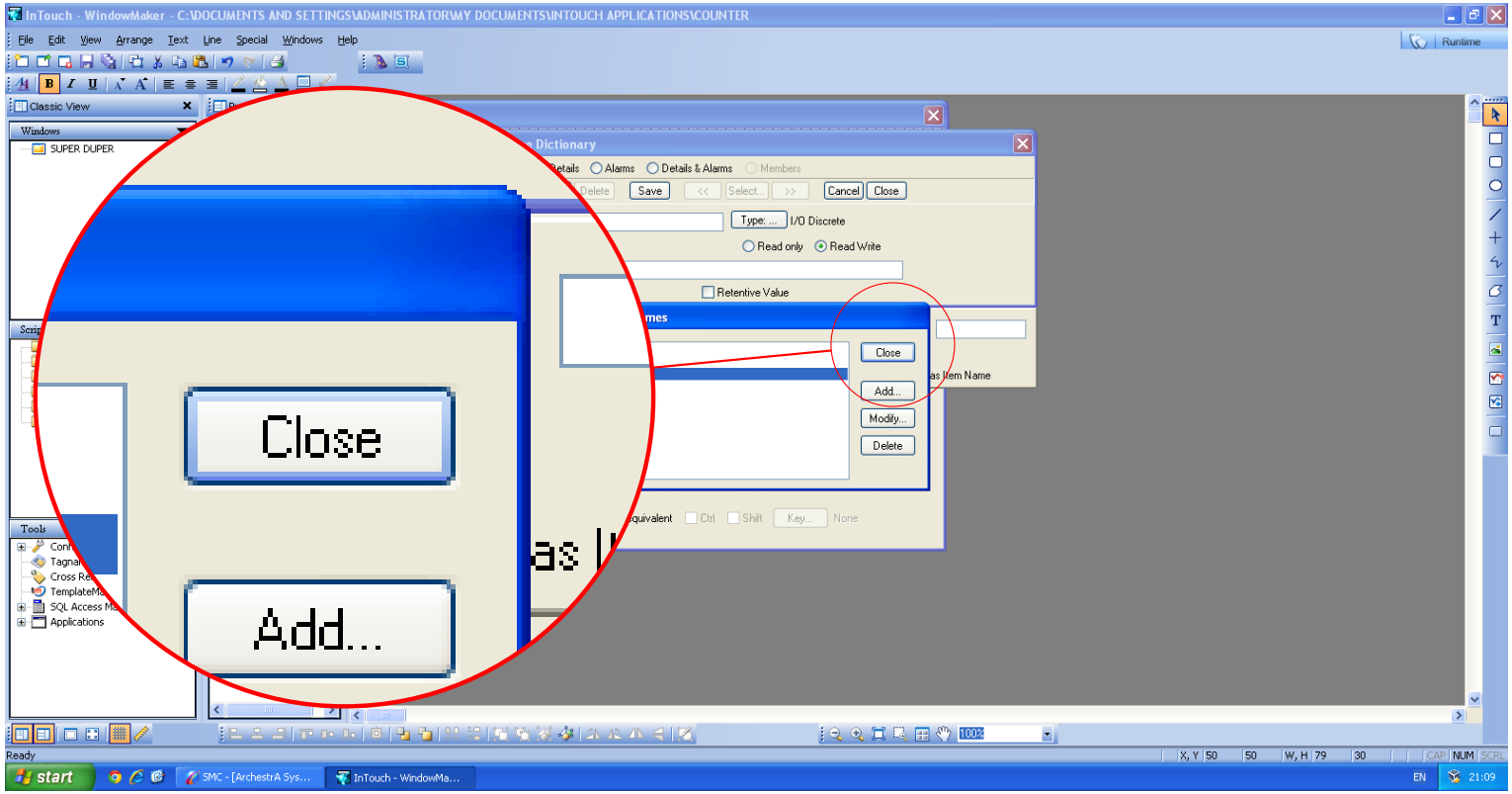

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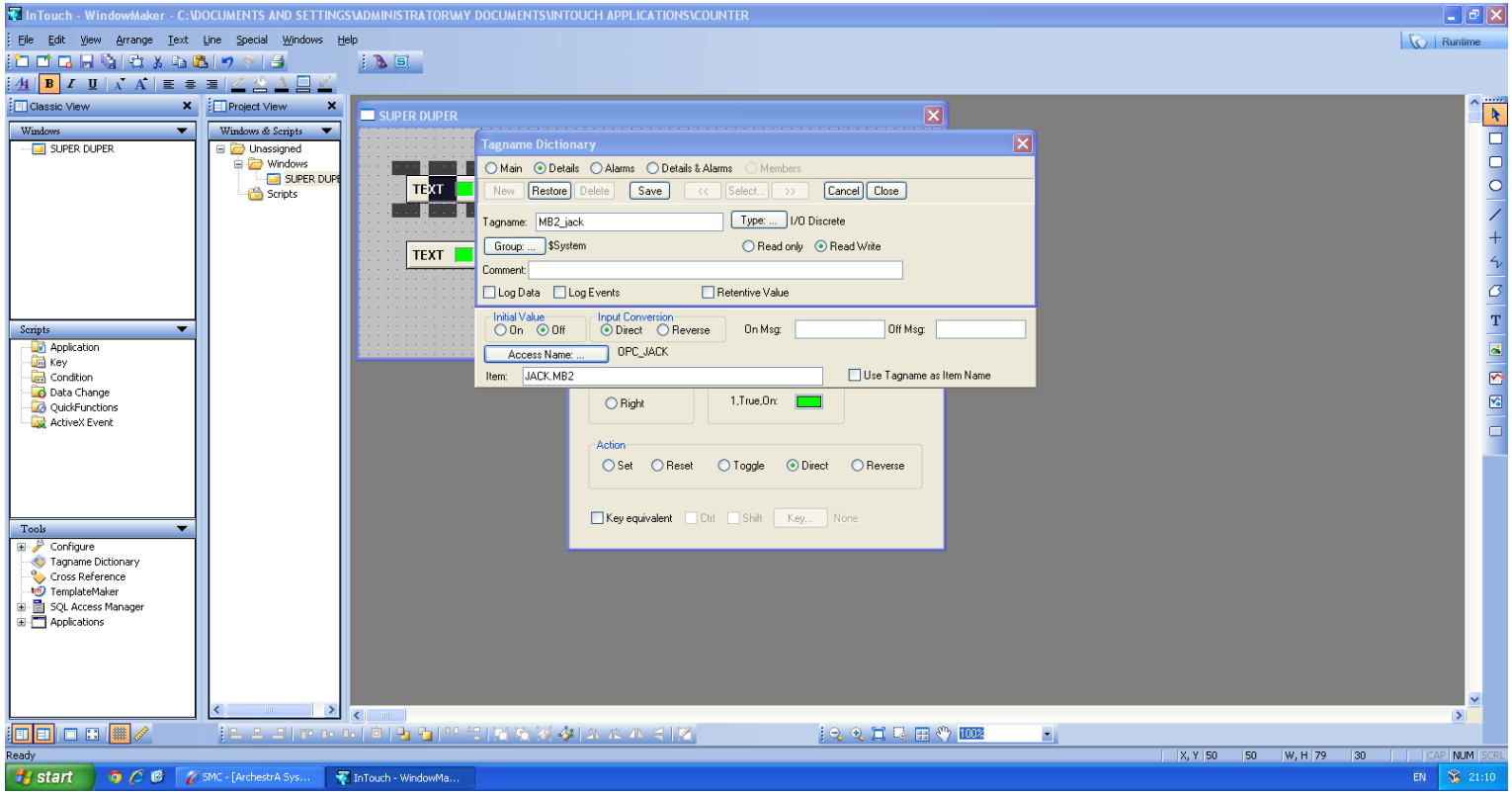

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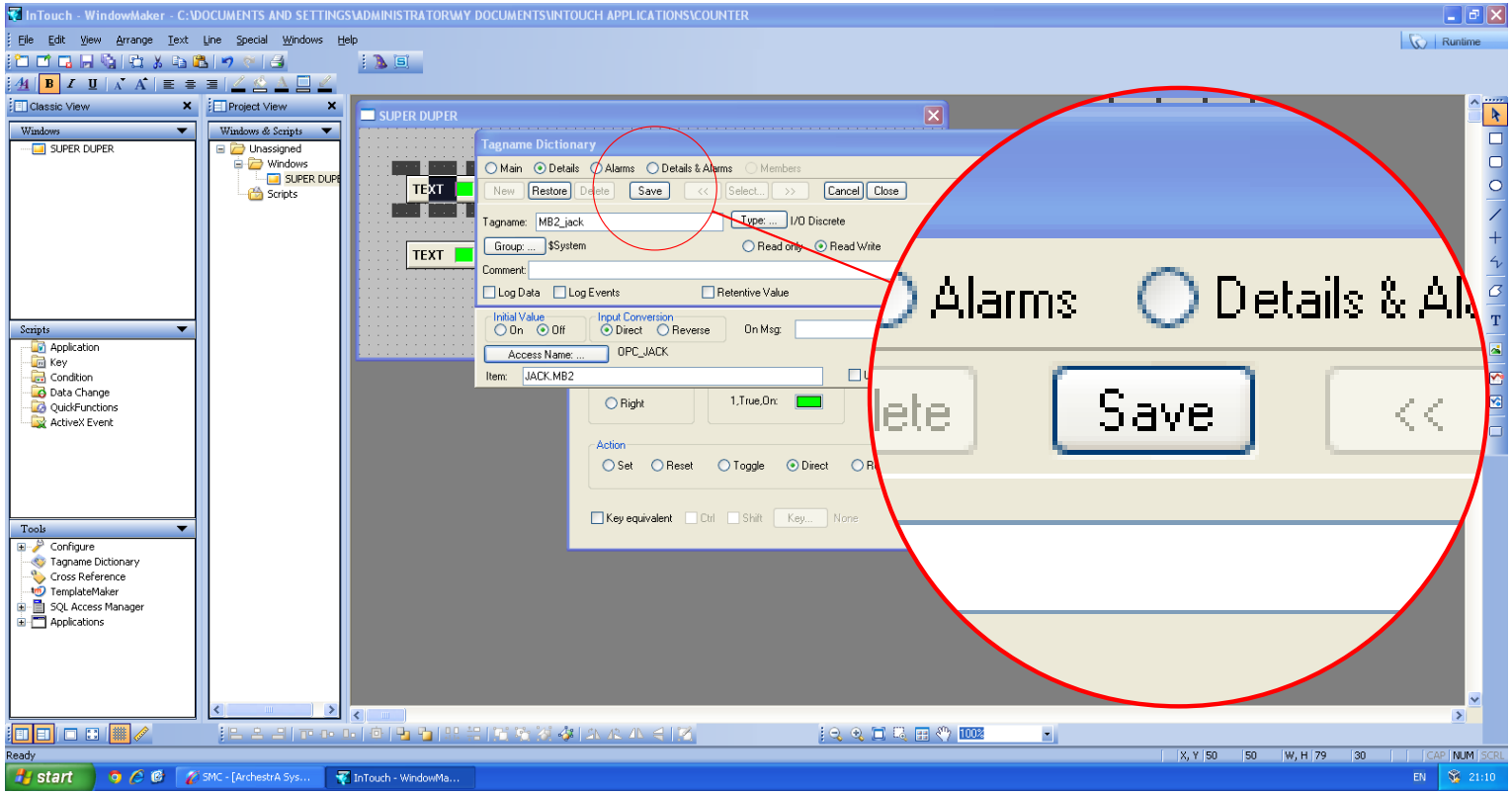
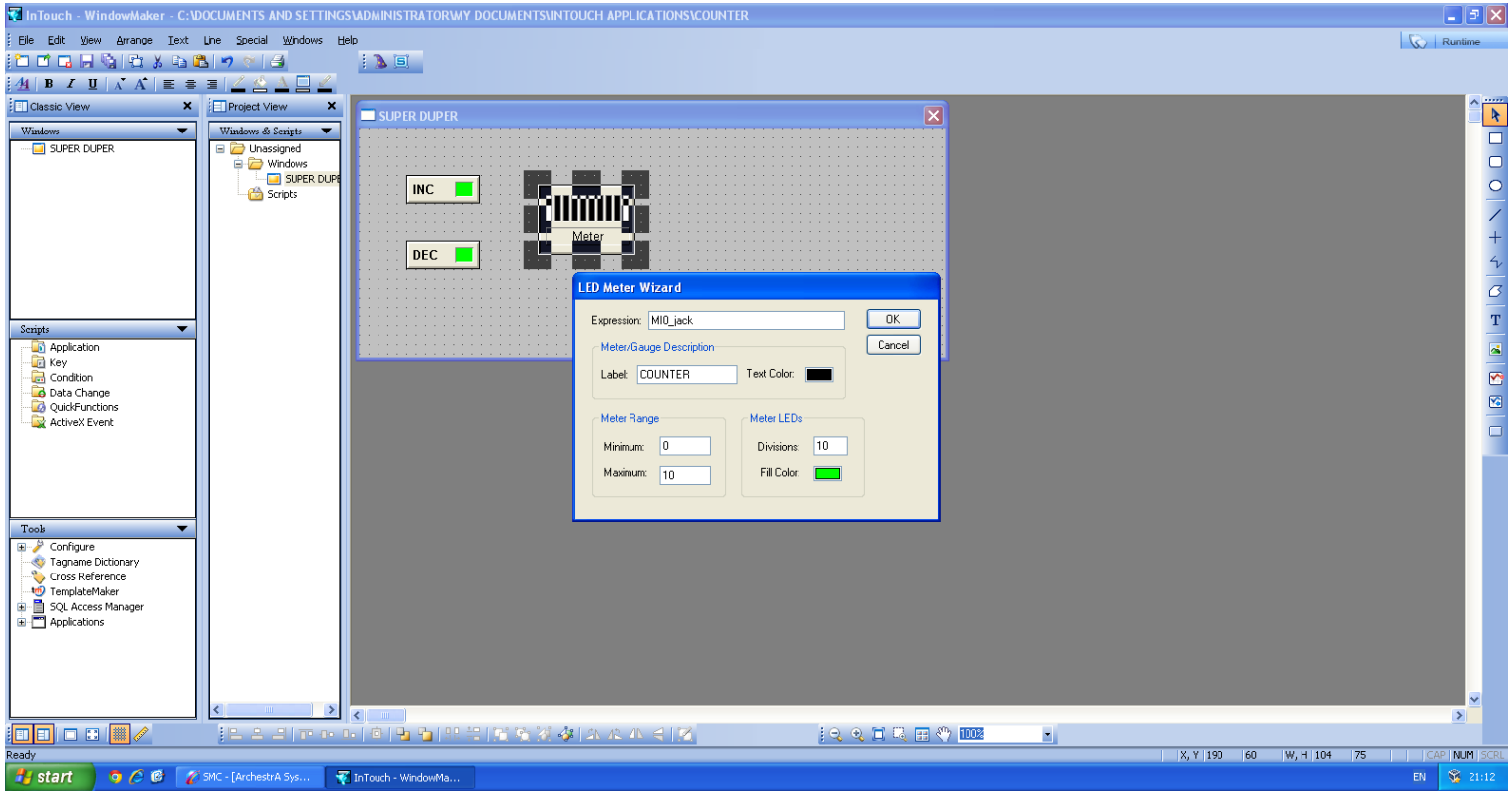


inTouch: create tags (2)



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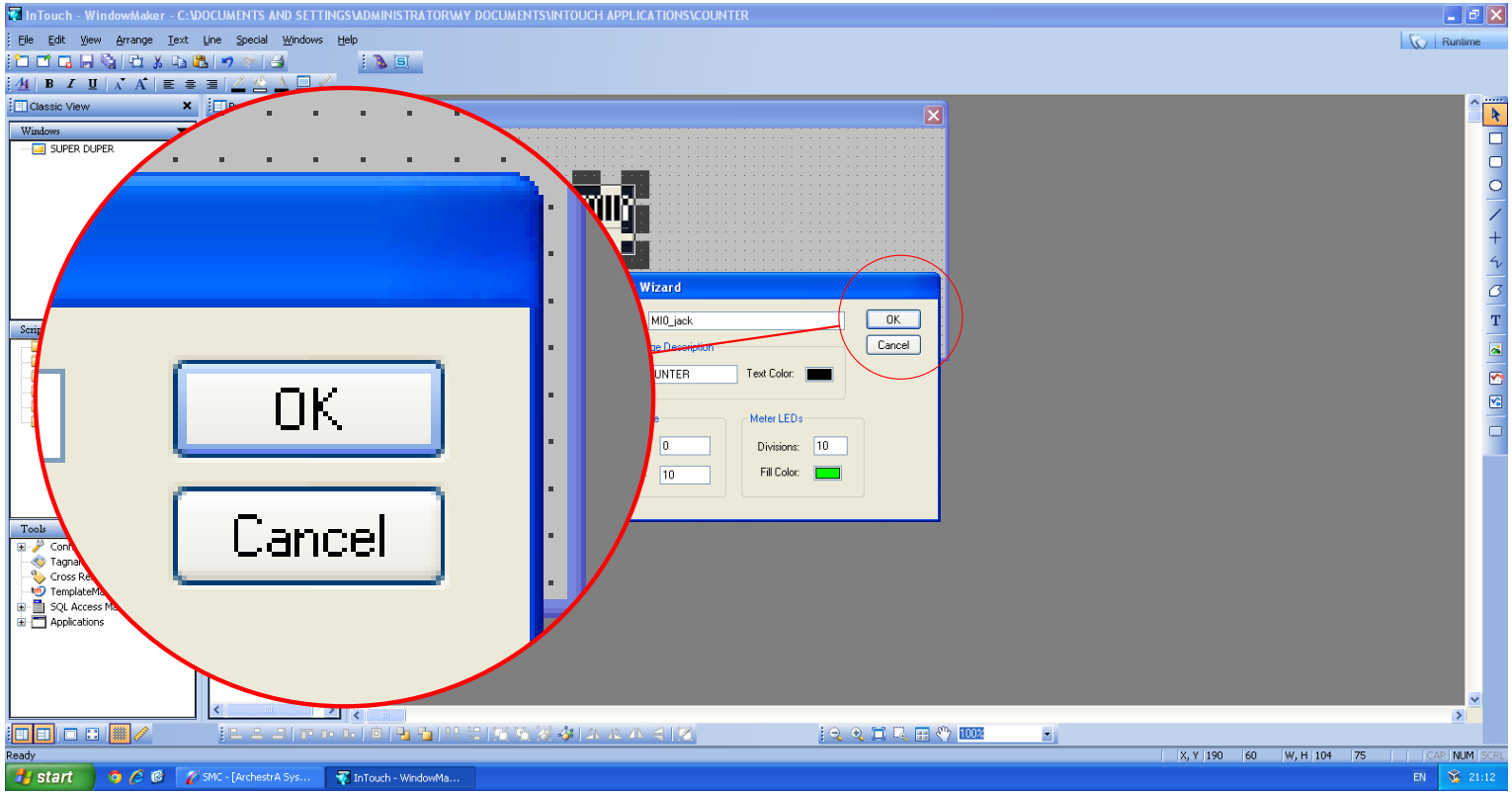
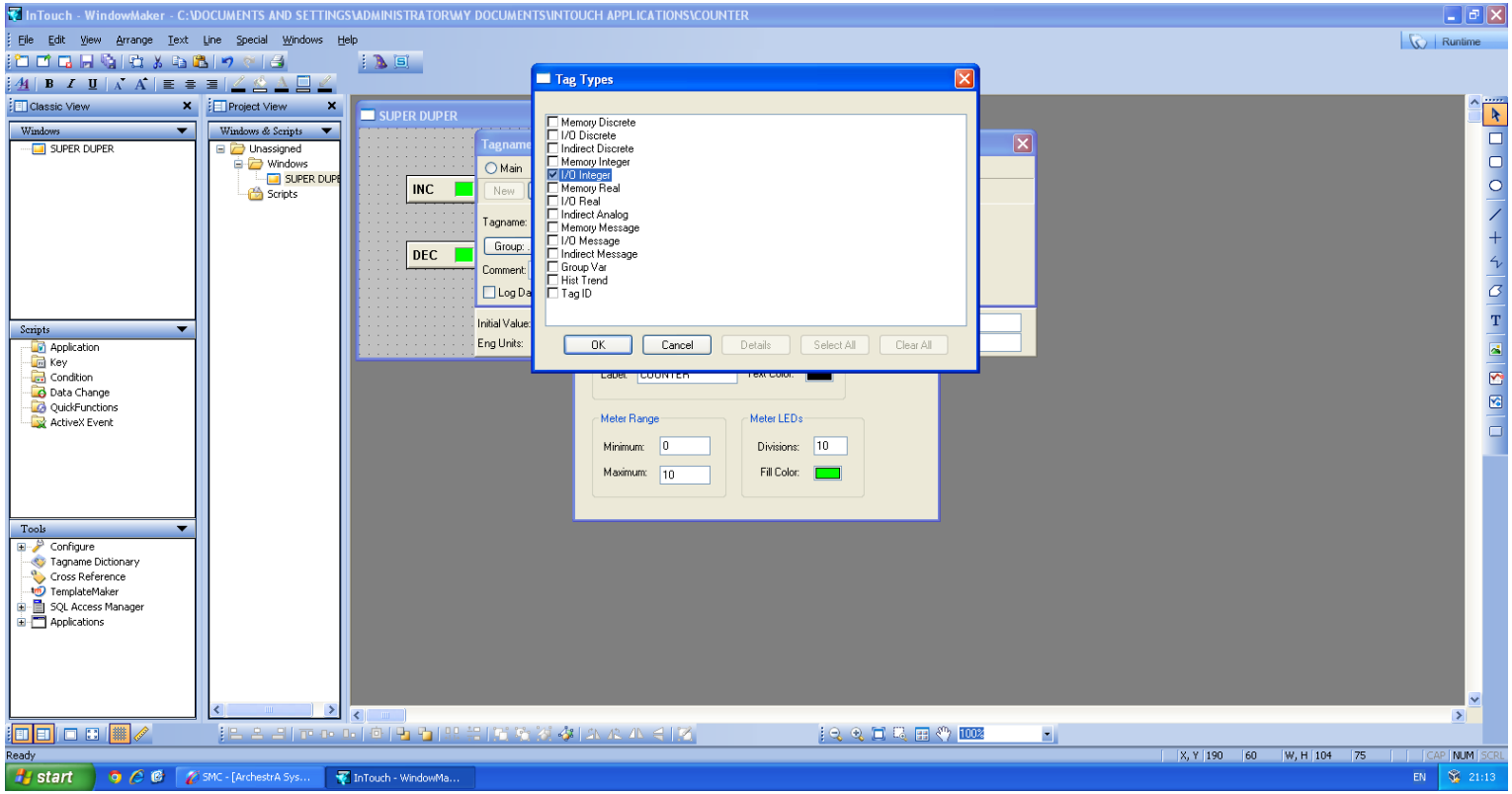
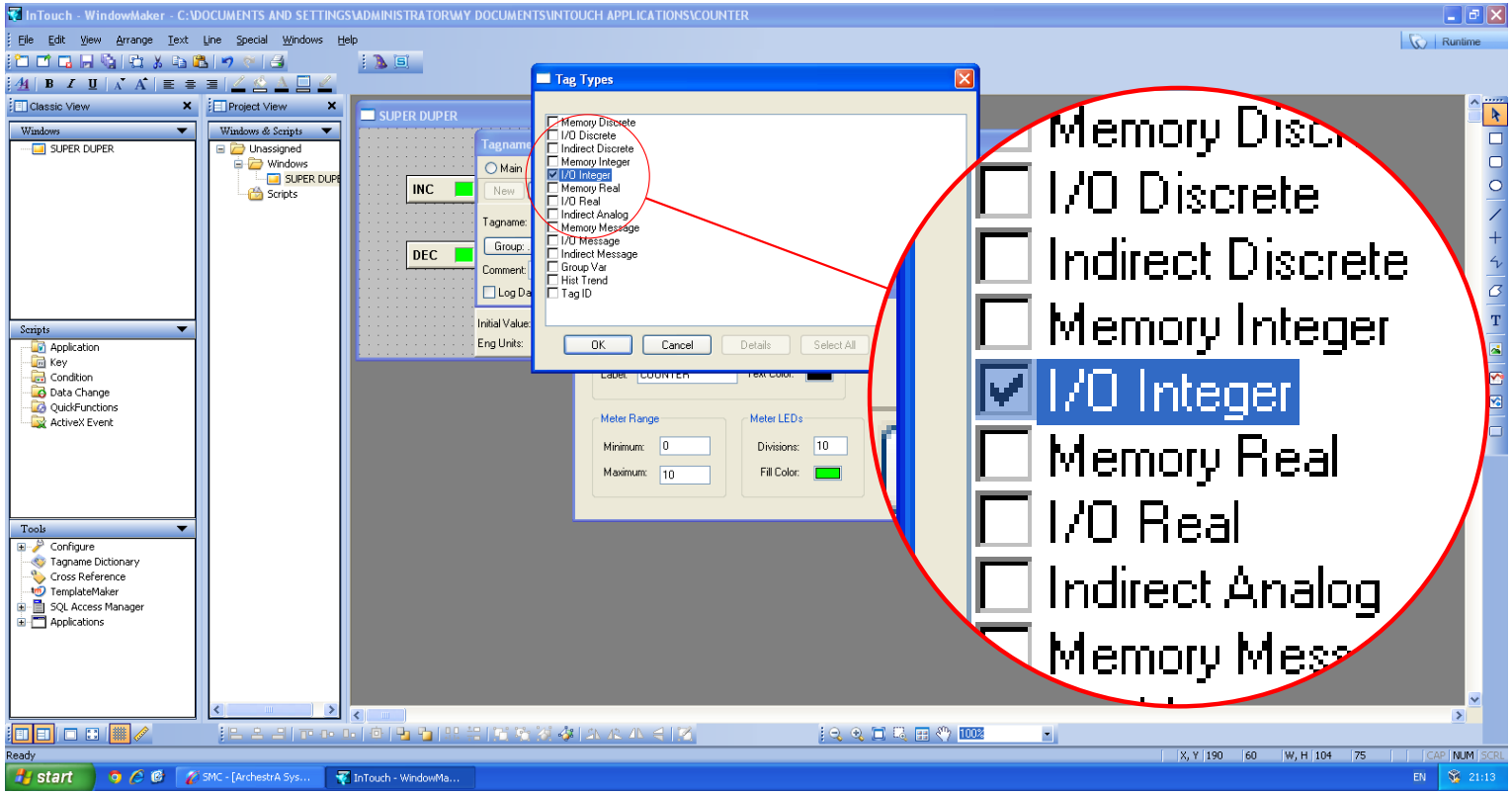


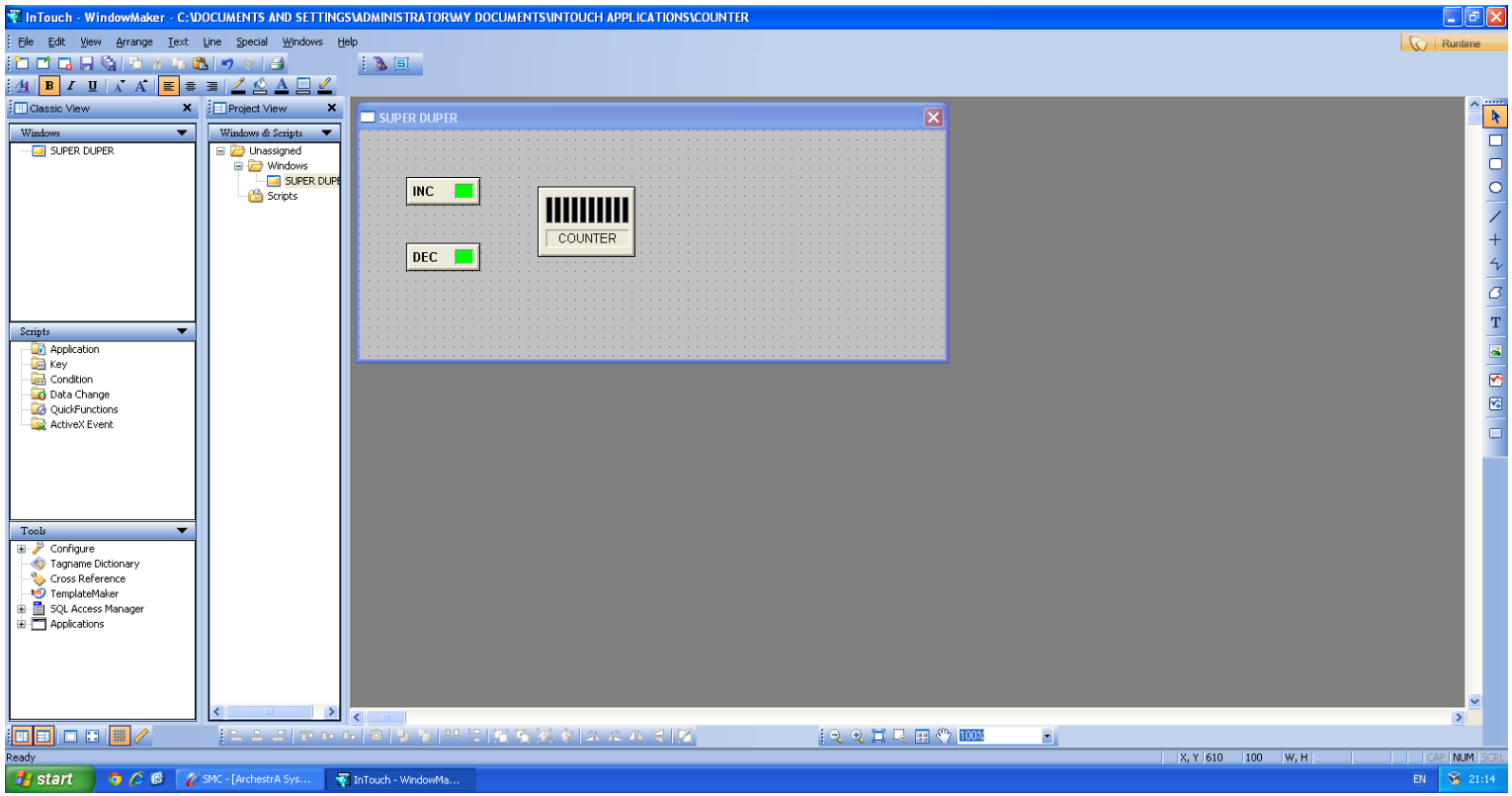
inTouch: create tags (2)



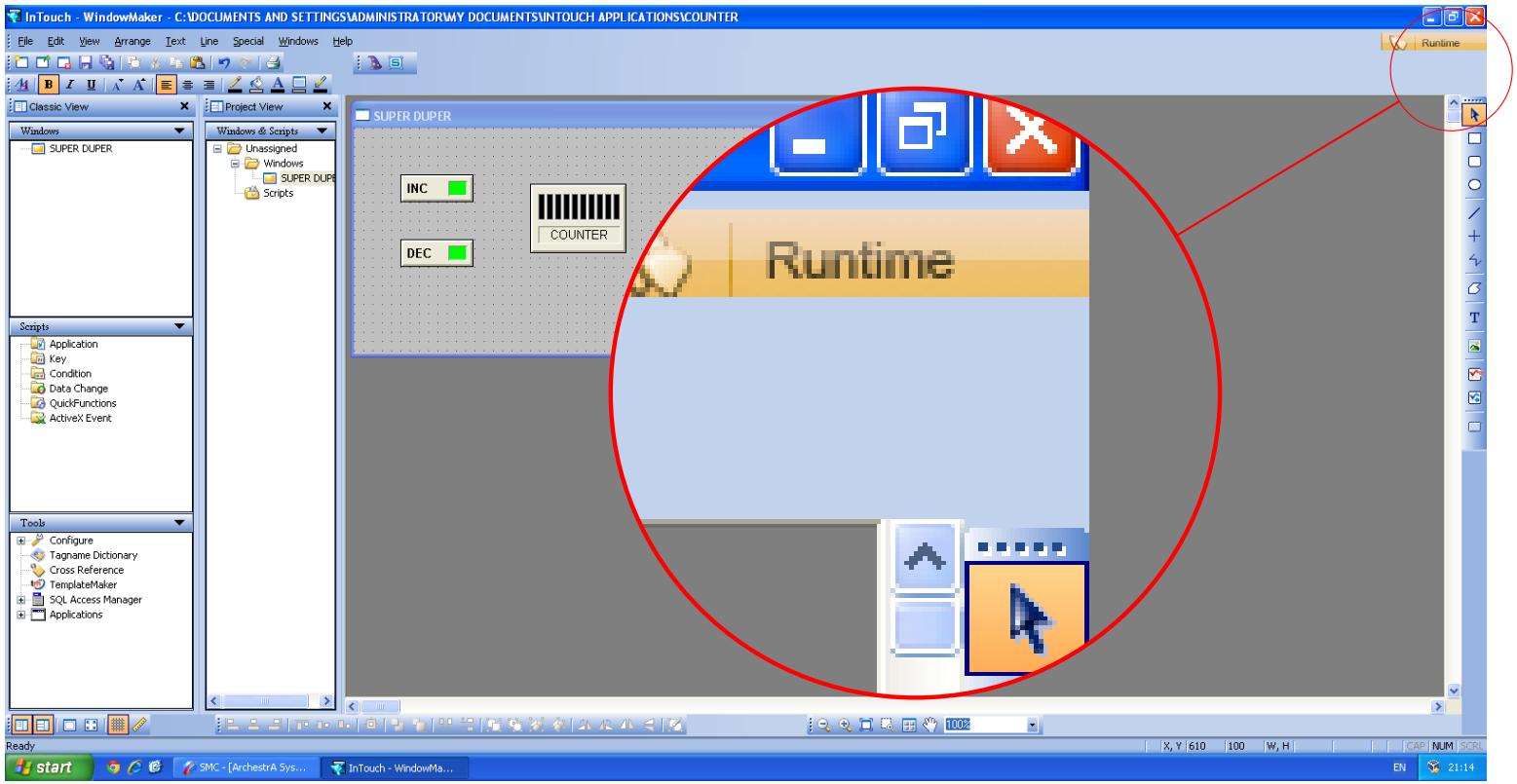
inTouch: create tags (2)



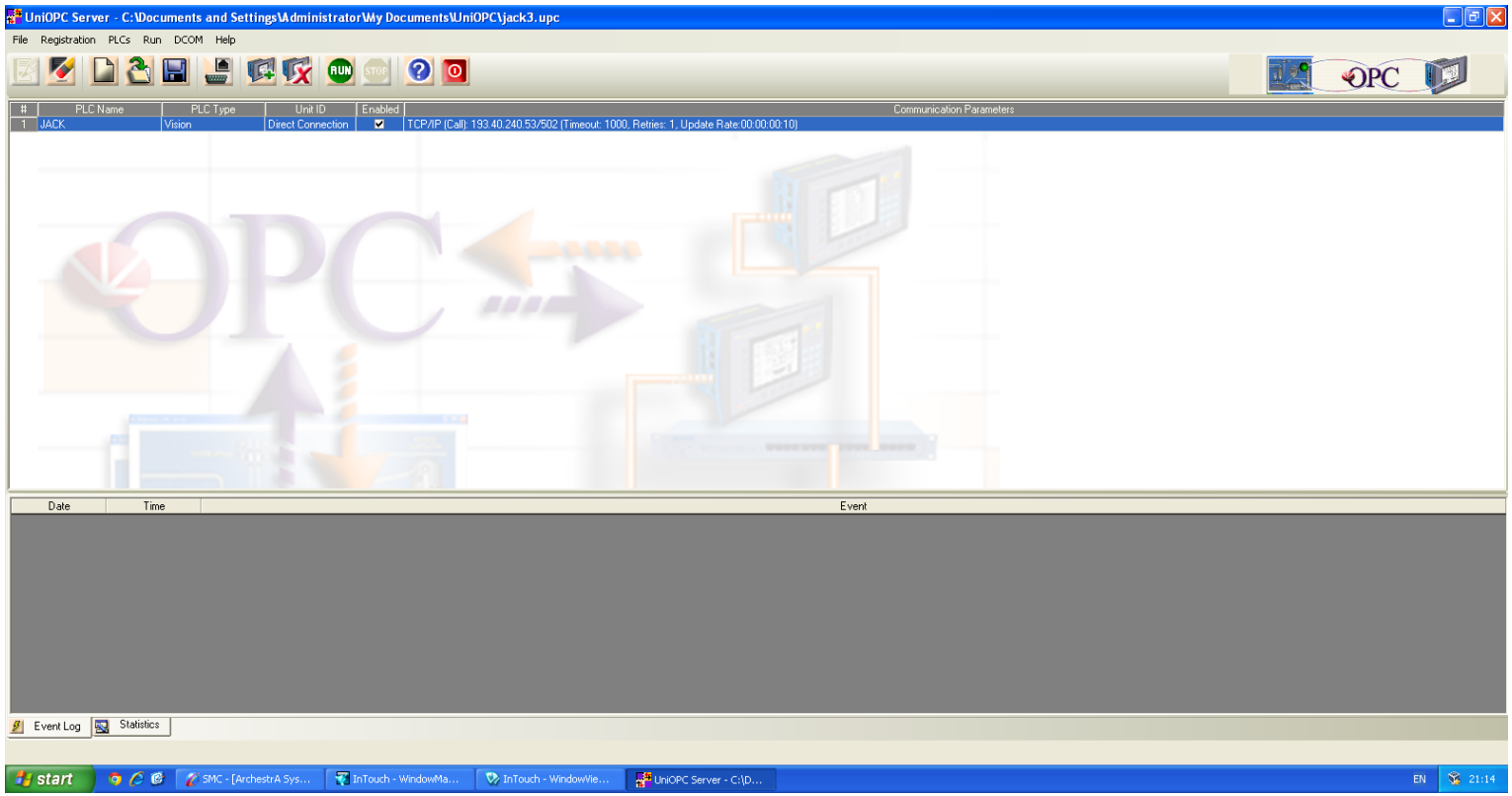
inTouch: launch runtime



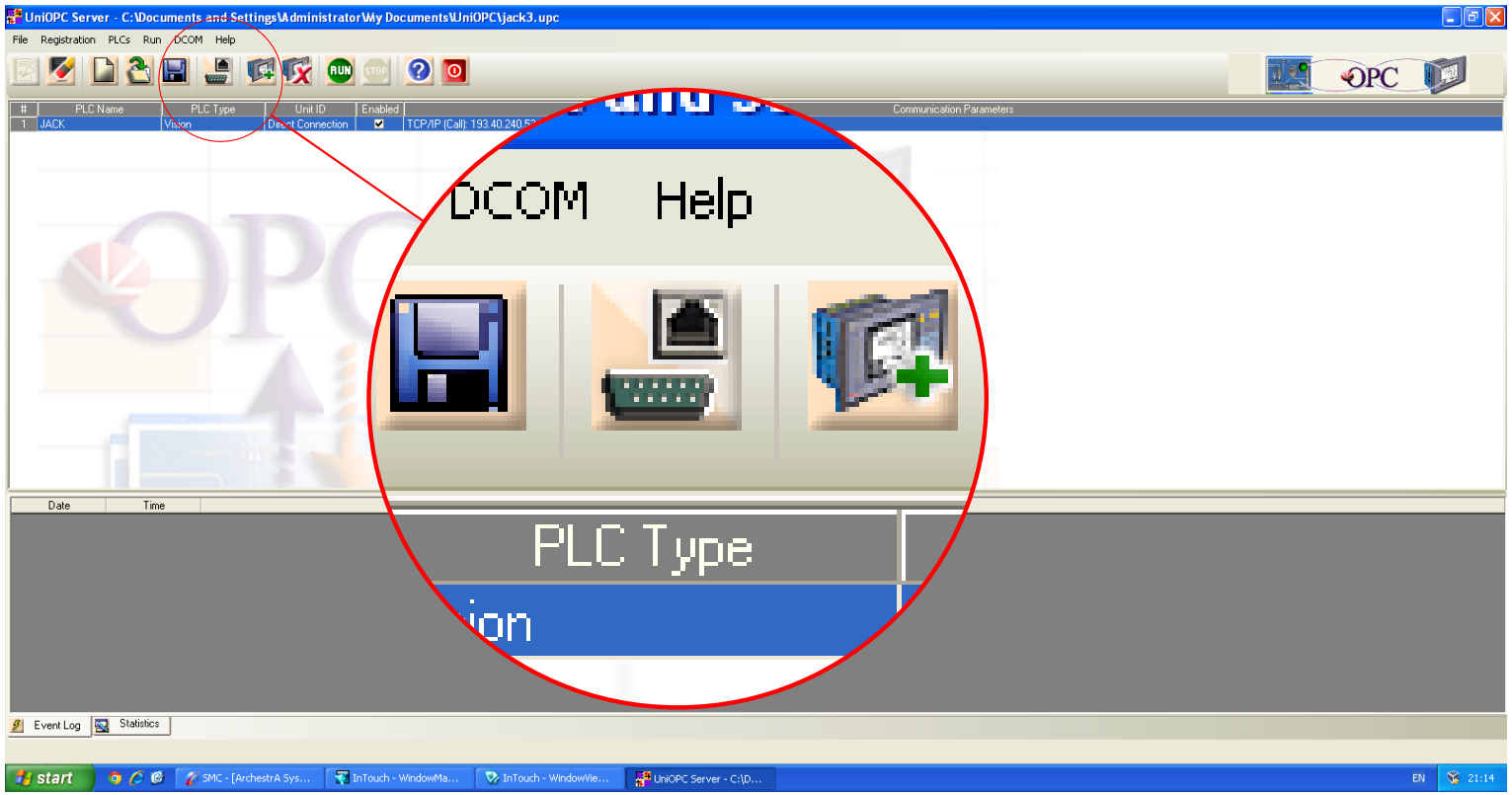
inTouch: launch runtime



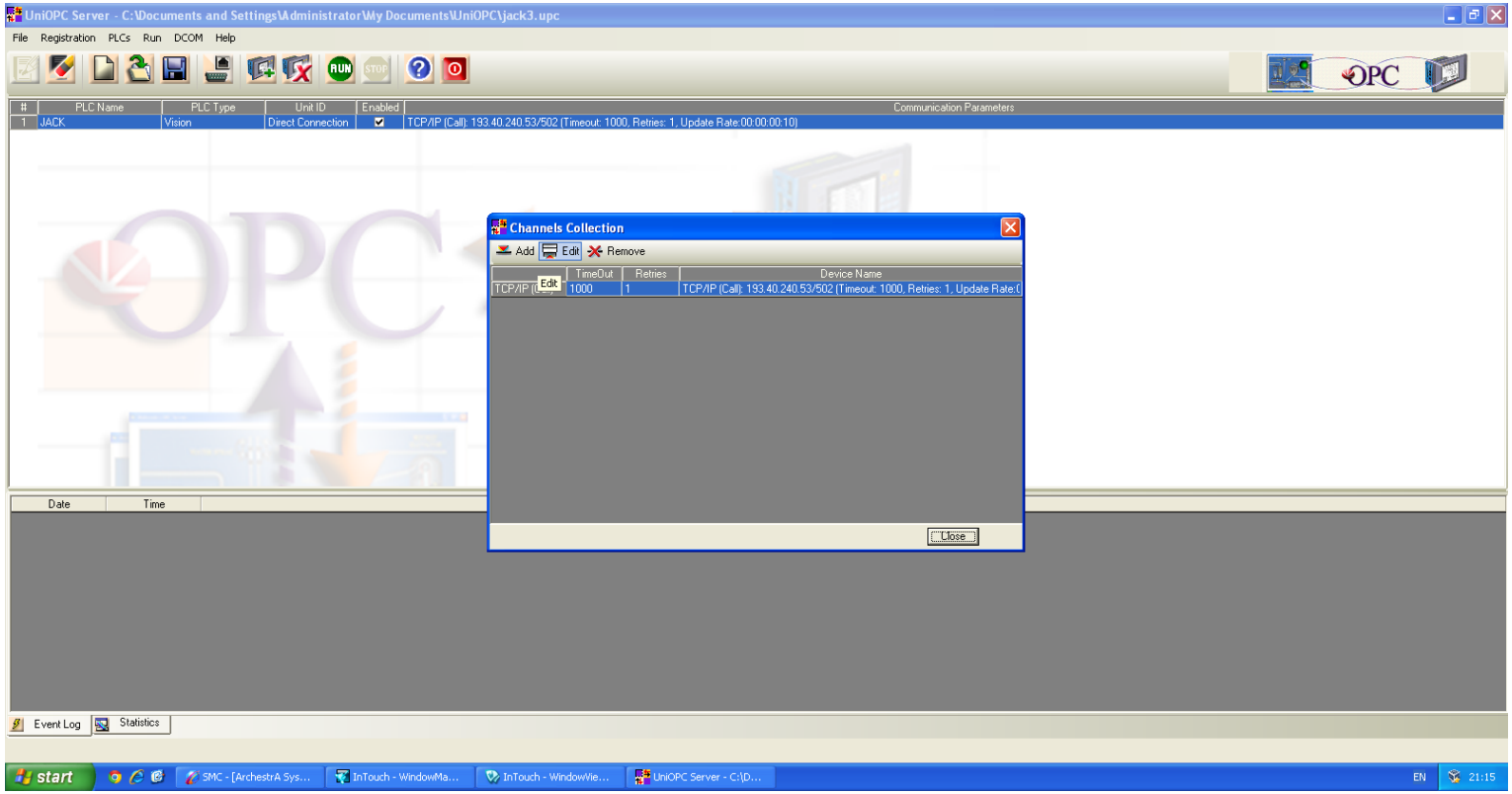
UniOPC: auto-launch



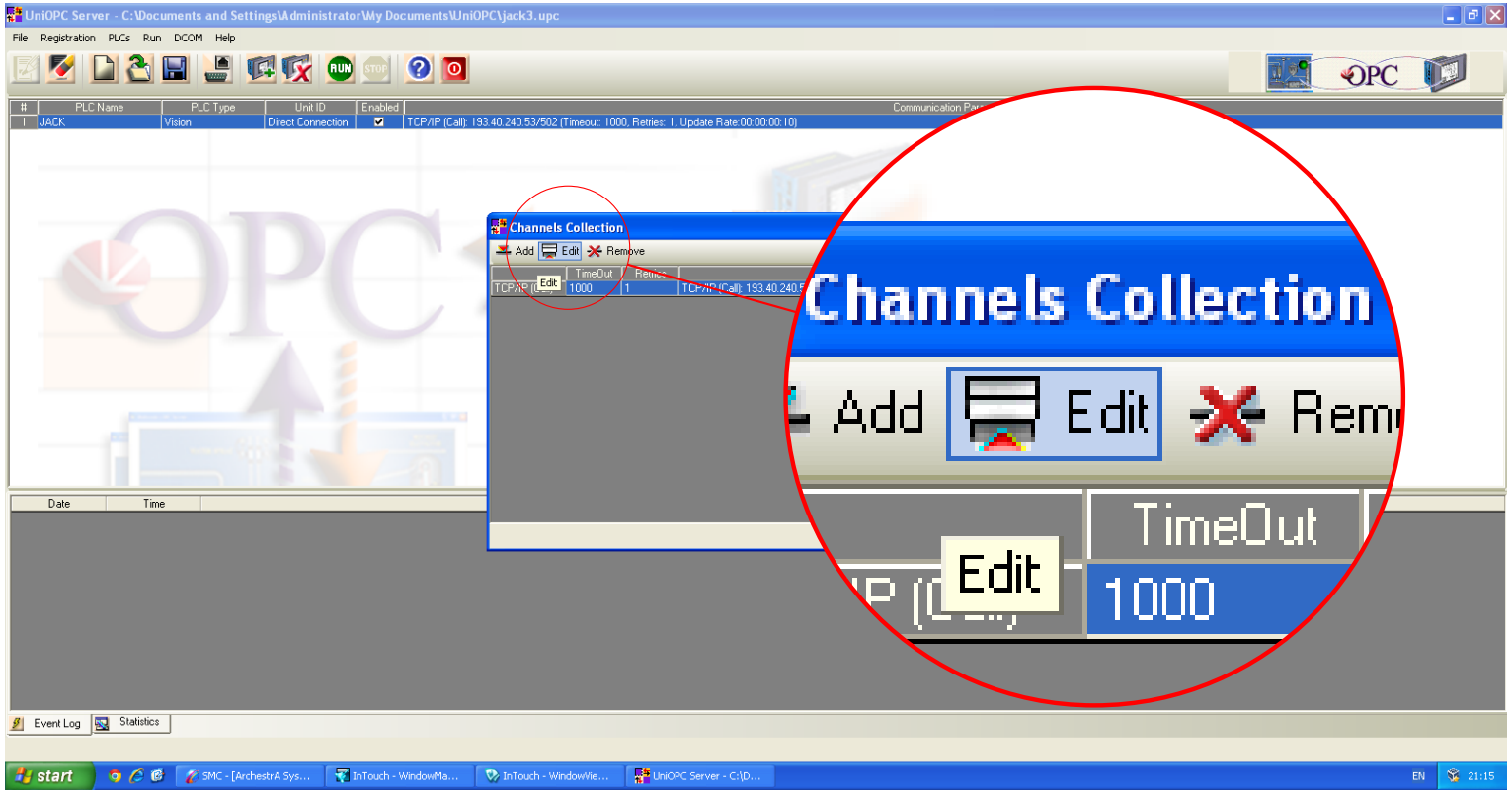
UniOPC: auto-launch



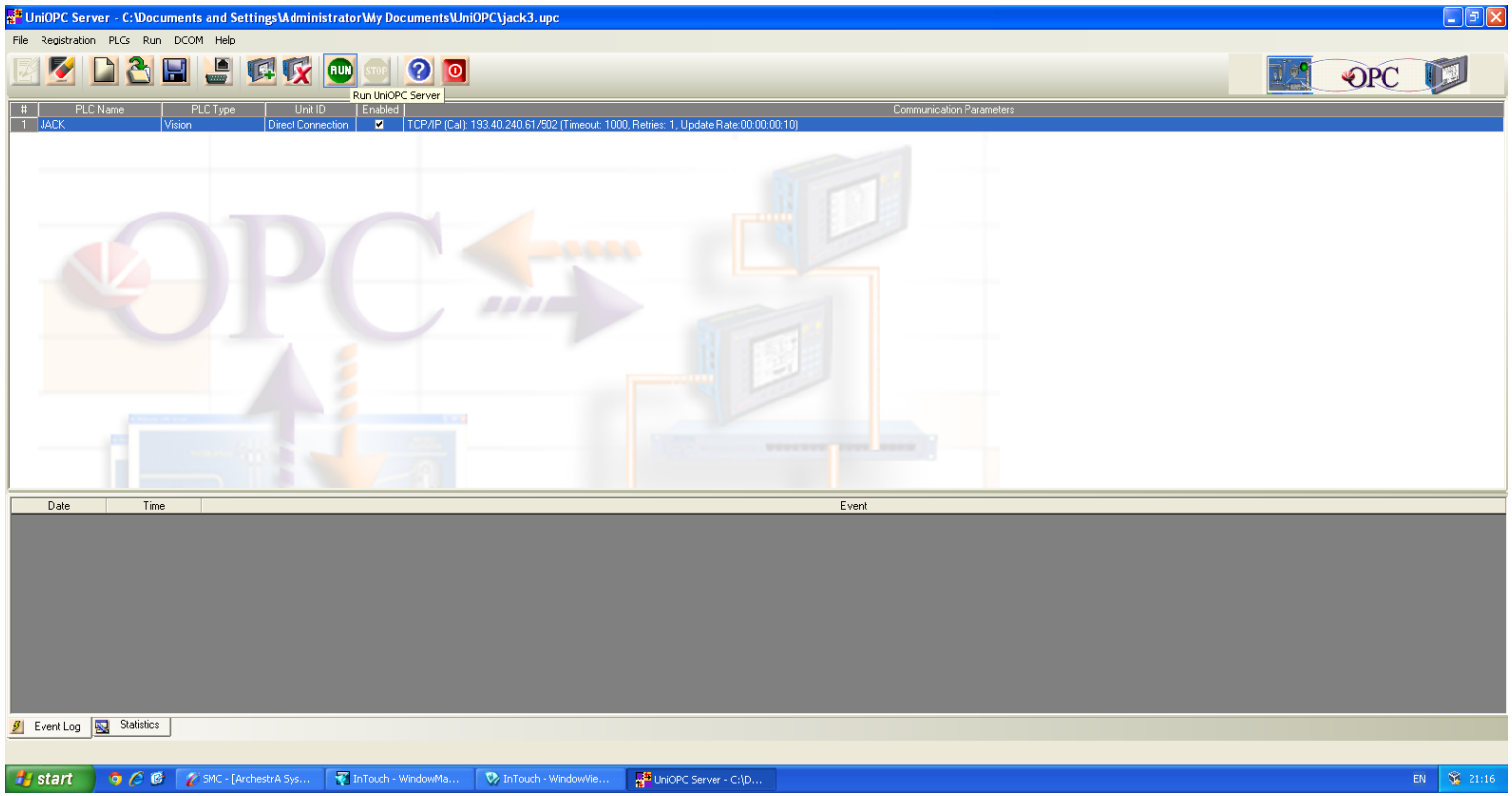
UniOPC: auto-launch



UniOPC: auto-launch

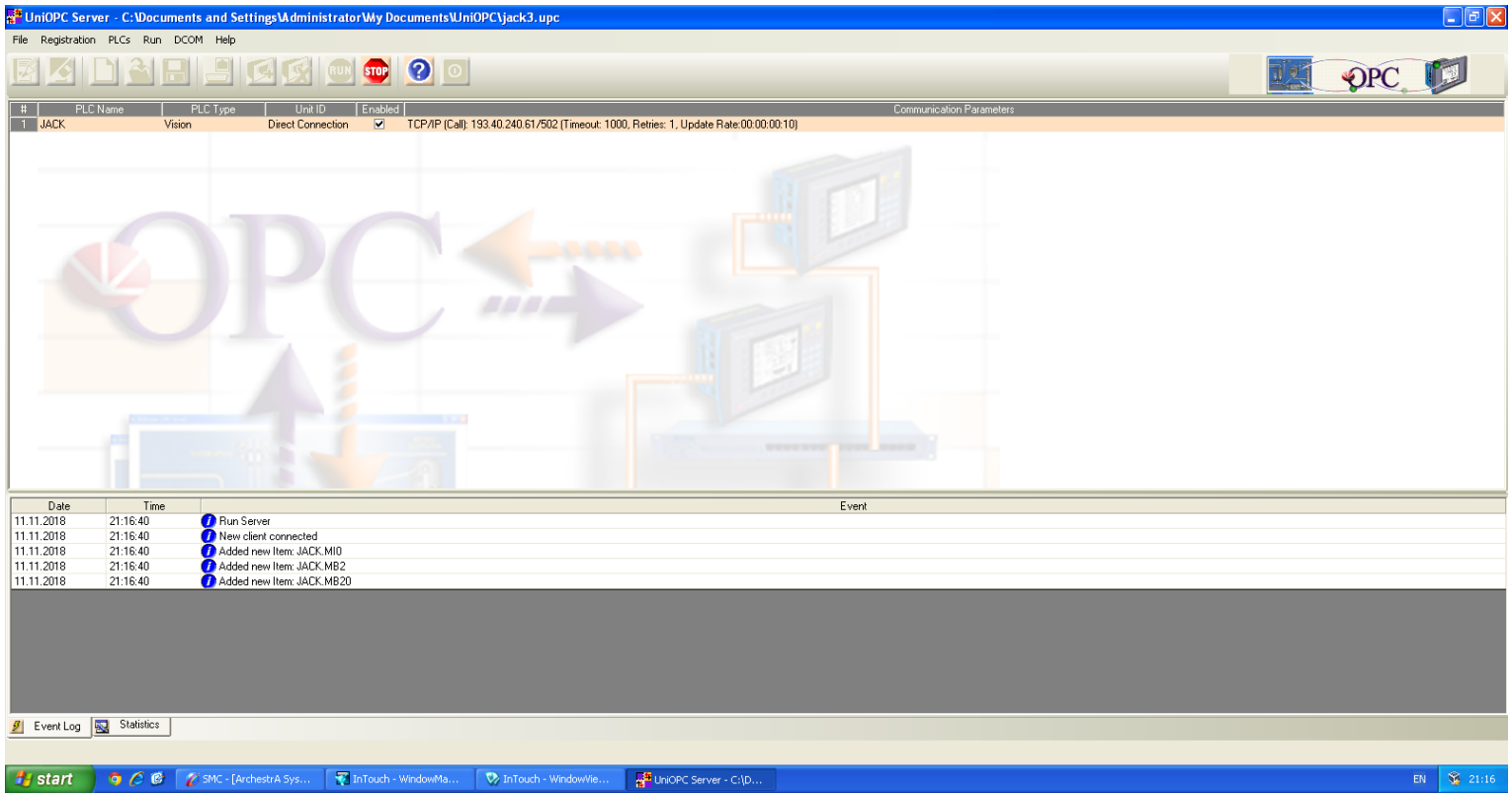


UniOPC: auto-launch



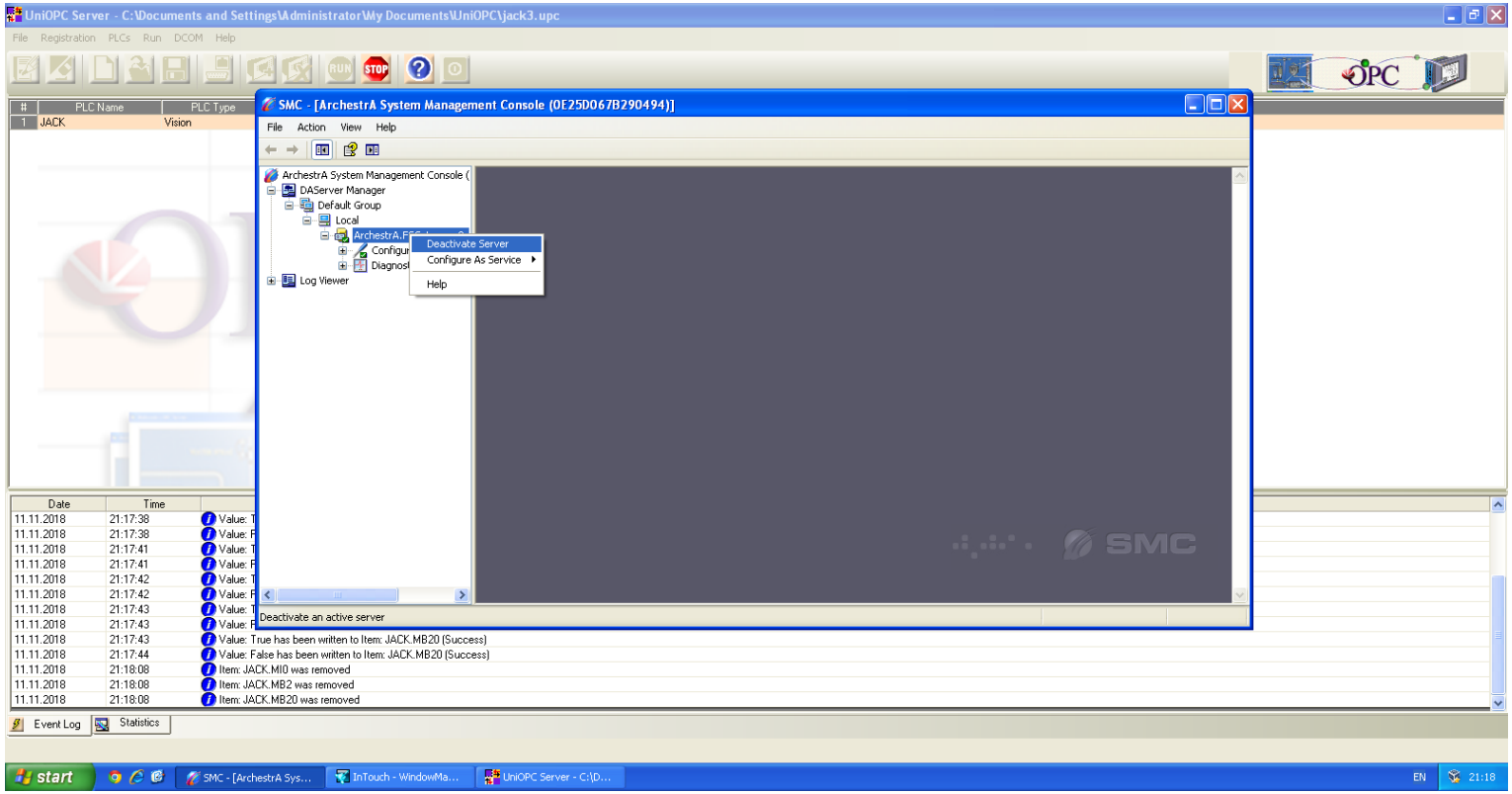
UniOPC: auto-launch

UniOPC: auto-launch

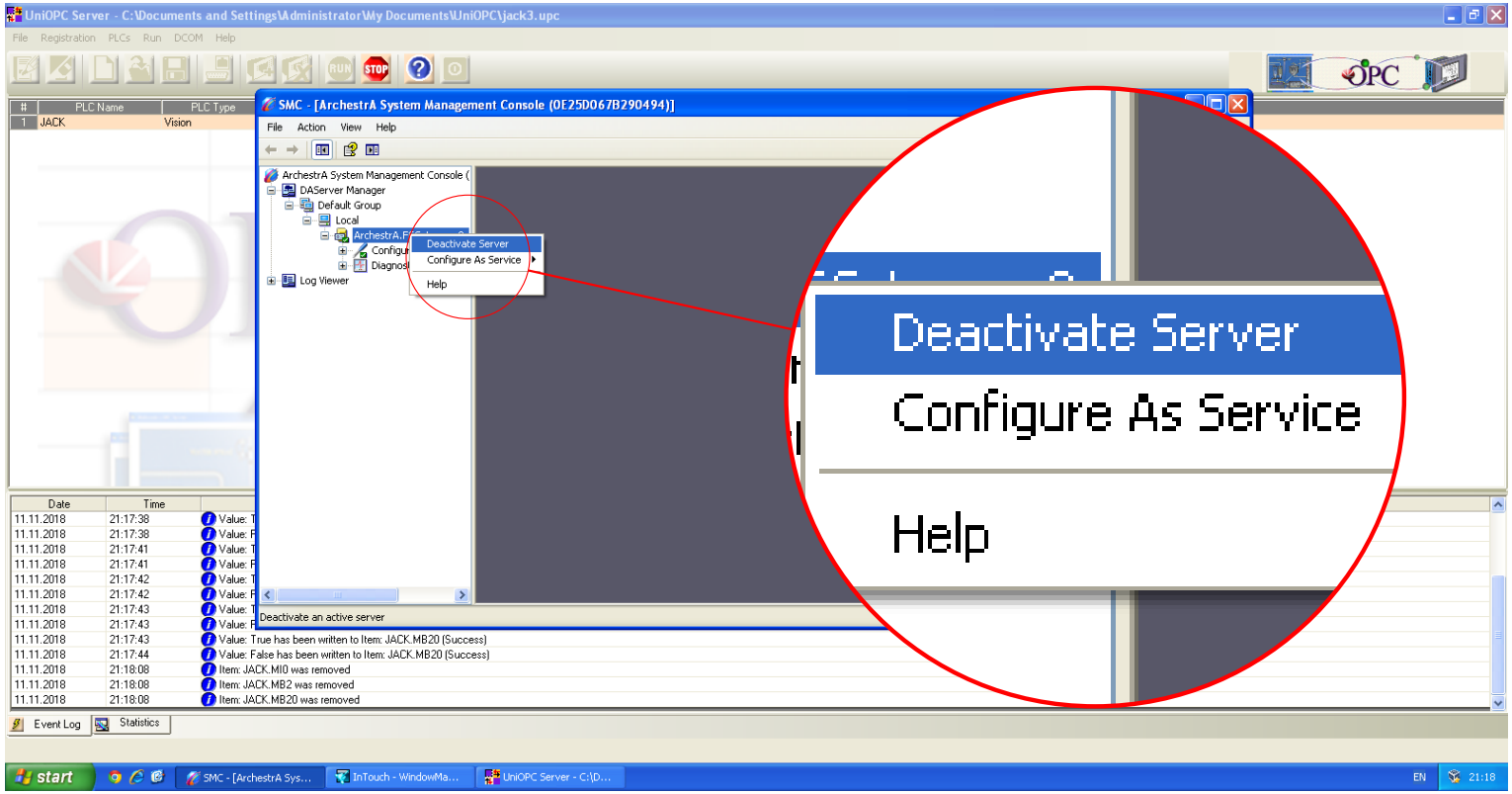


inTouch: runtime view

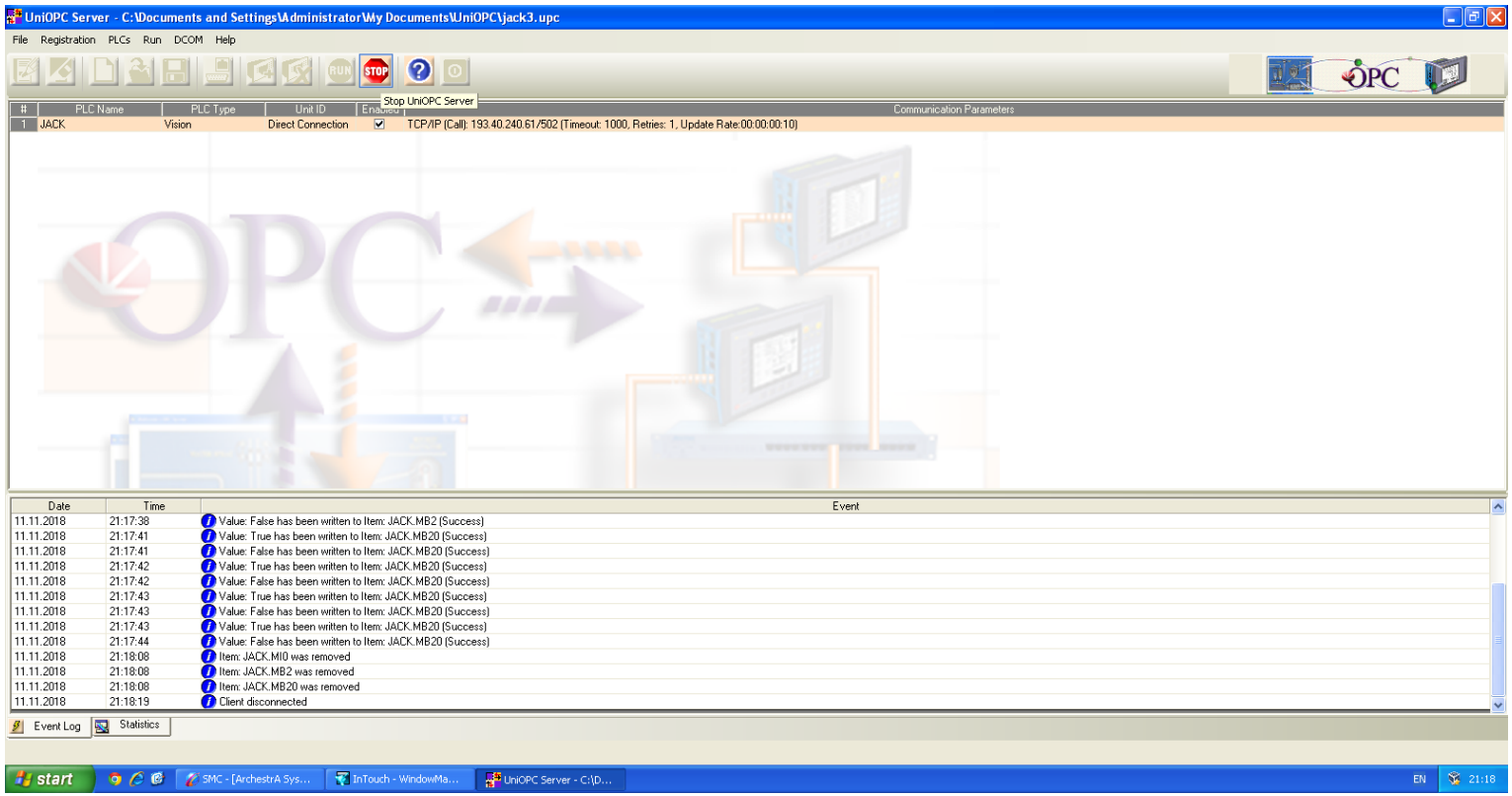
SMC: deactivate server



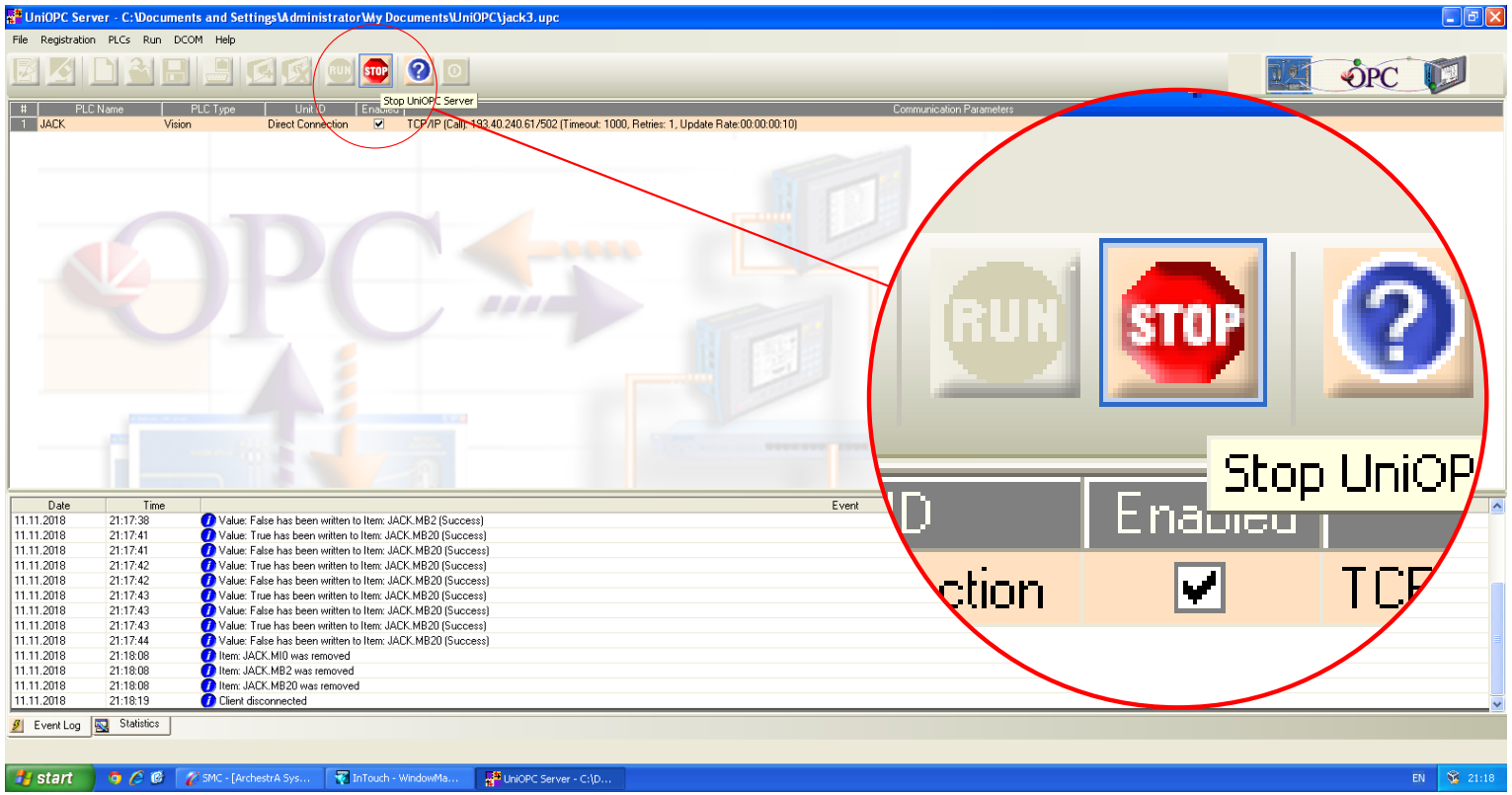
SMC: deactivate server



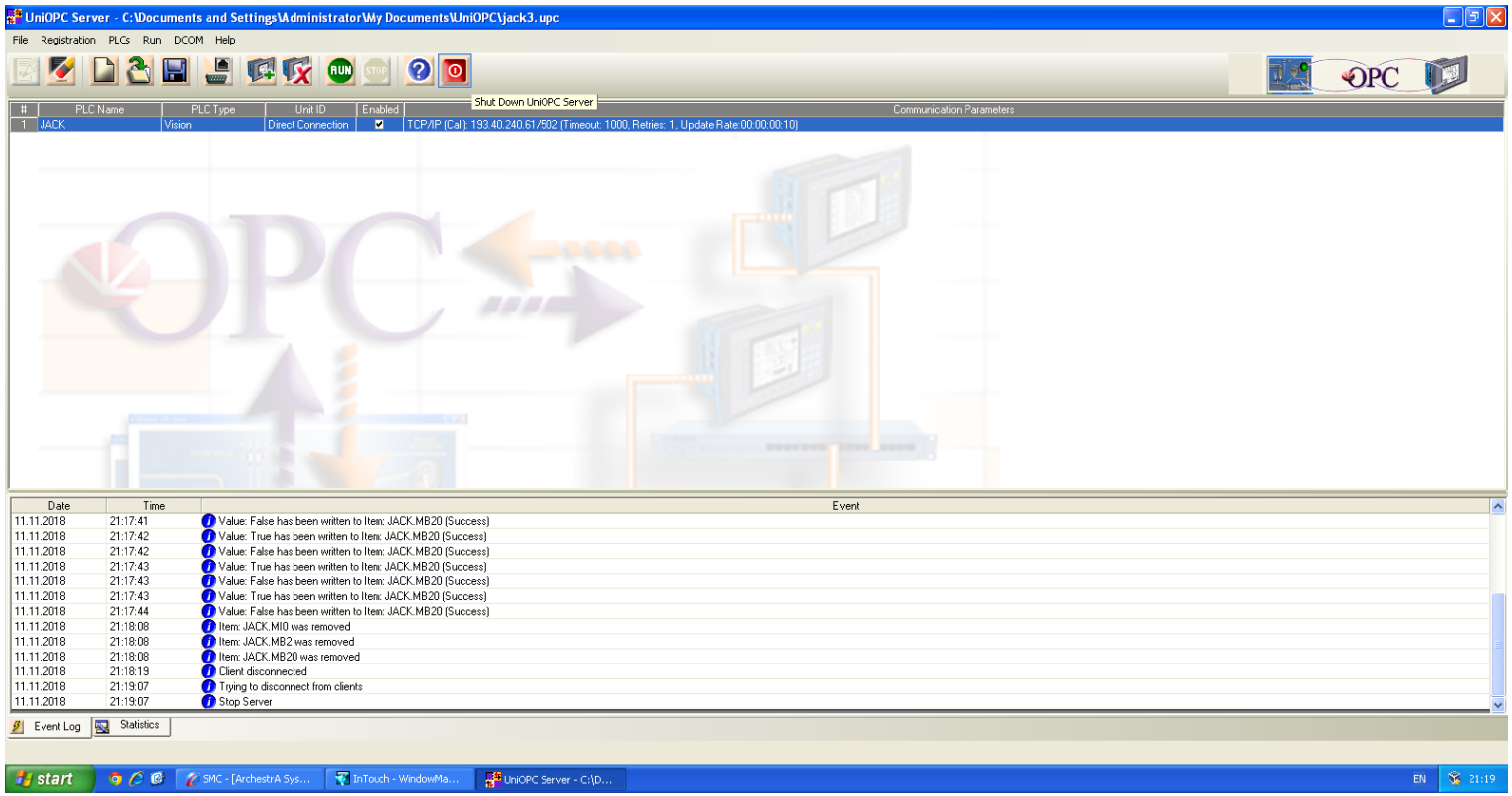
UniOPC: stop


UniOPC Server - C:\Documents and Settings\Administrator\My Documents\UniOPC\jack3.upc
File Registration PLCs Run DCOM Help
Stop UniOPC Server
PLC Name PLC Type Unit ID Enabled Communication Parameters
1 JACK Vision Direct Connection TCP/IP (Call): 193.40.240.61/502 (Timeout: 1000, Retries: 1, Update Rate:00:00:00:10)
Date Time Event
11.11.2018 21:17:38 Value: False has been written to Item: JACK.MB2 (Success)
11.11.2018 21:17:41 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:41 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:44 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:18:08 Item: JACK.MI0 was removed
11.11.2018 21:18:08 Item: JACK.MB2 was removed
11.11.2018 21:18:08 Item: JACK.MB20 was removed
11.11.2018 21:18:19 Client disconnected
Event Log
Statistics
start
SMC - [ArchestrA Sys...
InTouch - WindowMa...
UniOPC Server - C:\D...
EN
21:18

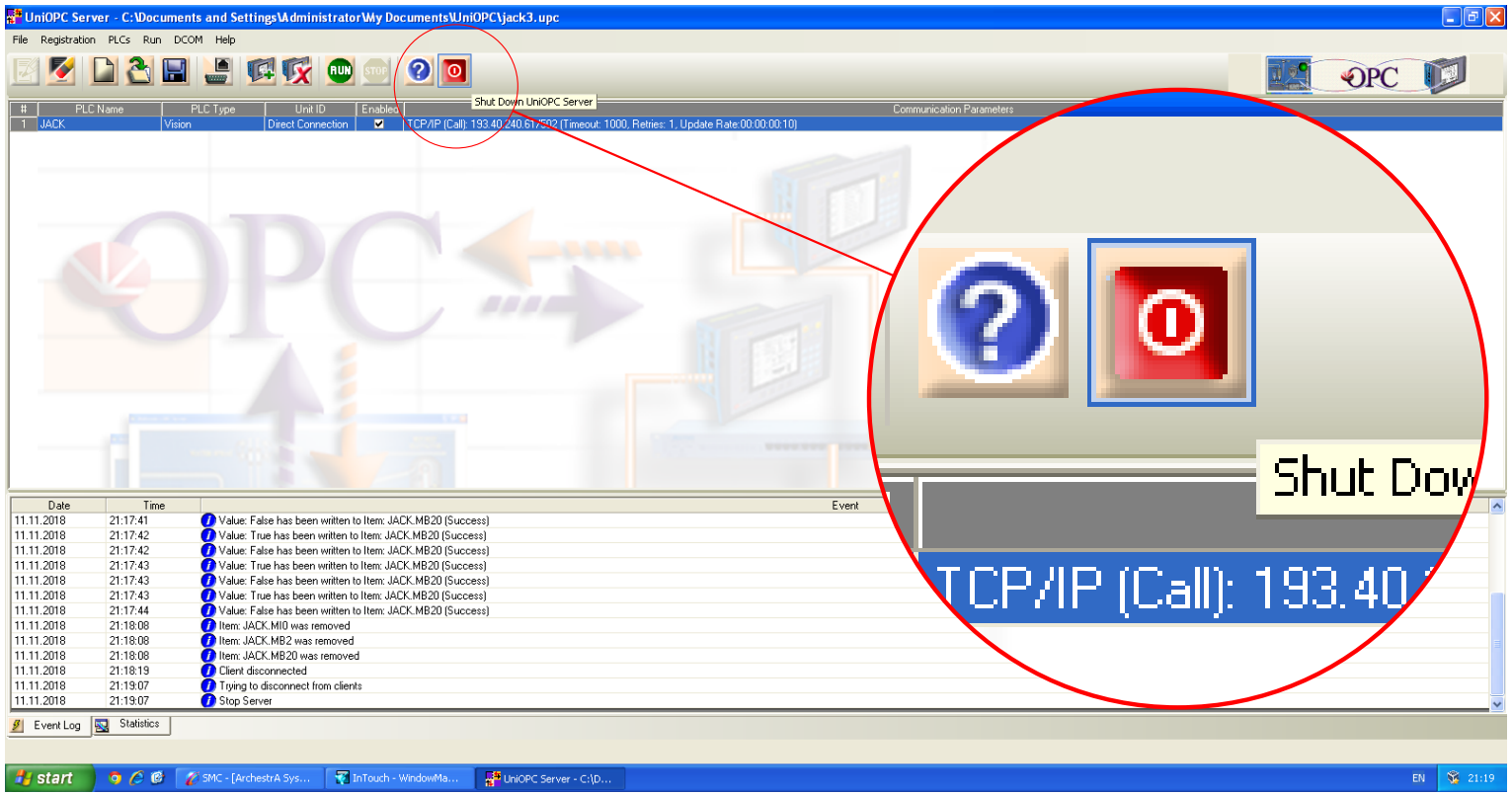
UniOPC: stop


UniOPC Server - C:\Documents and Settings\Administrator\My Documents\UniOPC\jack3.upc
File Registration PLCs Run DCOM Help
Stop UniOPC Server
PLC Name PLC Type Unit ID Enabled Communication Parameters
1 JACK Vision Direct Connection TCP/IP (Call: 193.40.240.61/502 (Timeout: 1000, Retries: 1, Update Rate:00:00:00:10)
RUN
STOP
Stop UniOP
Date Time Event
11.11.2018 21:17:38 Value: False has been written to Item: JACK.MB2 (Success)
11.11.2018 21:17:41 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:41 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:44 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:18:08 Item: JACK.MI0 was removed
11.11.2018 21:18:08 Item: JACK.MB2 was removed
11.11.2018 21:18:08 Item: JACK.MB20 was removed
11.11.2018 21:18:19 Client disconnected
Event Log
Statistics
start
EN
21:18

UniOPC: stop


UniOPC Server - C:\Documents and Settings\Administrator\My Documents\UniOPC\jack3.upc
File Registration PLCs Run DCOM Help
Shut Down UniOPC Server
PLC Name PLC Type Unit ID Enabled Communication Parameters
1 JACK Vision Direct Connection TCP/IP (Call): 193.40.240.61/502 (Timeout: 1000, Retries: 1, Update Rate:00:00:00:10)
Date Time Event
11.11.2018 21:17:41 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:44 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:18:08 Item: JACK.MI0 was removed
11.11.2018 21:18:08 Item: JACK.MB2 was removed
11.11.2018 21:18:08 Item: JACK.MB20 was removed
11.11.2018 21:18:19 Client disconnected
11.11.2018 21:19:07 Trying to disconnect from clients
11.11.2018 21:19:07 Stop Server
Event Log
Statistics
start
EN
21:19

UniOPC: stop


UniOPC Server - C:\Documents and Settings\Administrator\My Documents\UniOPC\jack3.upc
File Registration PLCs Run DCOM Help
Shut Down UniOPC Server
PLC Name PLC Type Unit ID Enabled Communication Parameters
1 JACK Vision Direct Connection TCP/IP (Call): 193.40.240.617:502 (Timeout: 1000, Retries: 1, Update Rate:00:00:00:10)
Date Time Event
11.11.2018 21:17:41 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:42 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:43 Value: True has been written to Item: JACK.MB20 (Success)
11.11.2018 21:17:44 Value: False has been written to Item: JACK.MB20 (Success)
11.11.2018 21:18:08 Item: JACK.MI0 was removed
11.11.2018 21:18:08 Item: JACK.MB2 was removed
11.11.2018 21:18:08 Item: JACK.MB20 was removed
11.11.2018 21:18:19 Client disconnected
11.11.2018 21:19:07 Trying to disconnect from clients
11.11.2018 21:19:07 Stop Server
Event Log
Statistics
start
Shut Dow
TCP/IP [Call]: 193.40