

MatDeck SCADA User Manual

MatDeck accommodates for the creation and management of SCADA applications in the form of its own No-Code SCADA Toolbox. The toolbox can be used to create standard SCADA applications as well as more complex and demanding systems. The idea is to create new custom SCADA applications that can be integrated with other MatDeck features including script programming, mathematical functions, virtual instrumentation and database management, without needing any experience in programming or SCADA systems.

Here below, we can see the SCADA Tag Manager which is the main form of the SCADA toolbox, with it you can create, edit and maintain a SCADA, Logger and more.

Tag Manager

PC IP Address: 127.0.0.1 Port: 1501

Buttons: Import Channel Tags, Add Instrument Tag, Delete All Tags, Enable All Tags, Disable All Tags

Tags

Instrument	Tag	Channel
1	analog circular	1 7017 AI 2
<input checked="" type="checkbox"/> Enable Tag	Send To: 127.0.0.1 1806	
Delete Tag	<input checked="" type="checkbox"/> Min: -50 <input checked="" type="checkbox"/> Max: 50	
Channel	Tag Variable: tg_1_7017_AI_2	Event Variable: tg_e1_7017_AI_2
2	analog circular	1 7017 AI 4
<input checked="" type="checkbox"/> Enable Tag	Send To: 127.0.0.1 1807	
Delete Tag	<input checked="" type="checkbox"/> Min: 50 <input checked="" type="checkbox"/> Max: 100	
Channel	Tag Variable: tg_1_7017_AI_4	Event Variable: tg_e1_7017_AI_4
3	analog circular	1 7017 AI 7
<input checked="" type="checkbox"/> Enable Tag	Send To: 127.0.0.1 1808	
Delete Tag	<input checked="" type="checkbox"/> Min: -5 <input checked="" type="checkbox"/> Max: 5	
Channel	Tag Variable: tg_1_7017_AI_7	Event Variable: tg_e1_7017_AI_7

SCADA

Start Stop Script Rate: 10 ms

Buttons: New, Load, Save, Panel, Code, Log, In Doc.

As SCADA applications use hardware devices for different data processes, the hardware device itself must also be configured. This is done using configuration forms like the one below. With these forms you can connect to hundreds of devices without a single line of code. This will be covered in further detail later on.

`m70 := icpcom_multifunction7000_form(0, "Form")`

Module Selection

Device List - Address and ID

Device Name

Module Configuration

Address1Fast ModeNormalAnalog FormatEngineeringResponse Delay0msFilter60HzRejection

INIT Configuration

ProtocolDCONParityN,8,1Baud Rate9600ChecksumDisable

AI(0:3)AI(4:7)AO(0:3)DO(0:3)DI(0:4)Host WDT

Ch 0

Enable

Type-5~5 V

Alarm ModeDisable

High Alarm Limit5.00

Low Alarm Limit-5.00

Use as SCADA Tag

Ch 1

Enable

Type-5~5 V

Alarm ModeDisable

High Alarm Limit5.00

Low Alarm Limit-5.00

Use as SCADA Tag

Ch 2

Enable

Type-10~10 V

Alarm ModeDisable

High Alarm Limit0.00

Low Alarm Limit0.00

Use as SCADA Tag

Ch 3

Enable

Type-10~10 V

Alarm ModeDisable

High Alarm Limit0.00

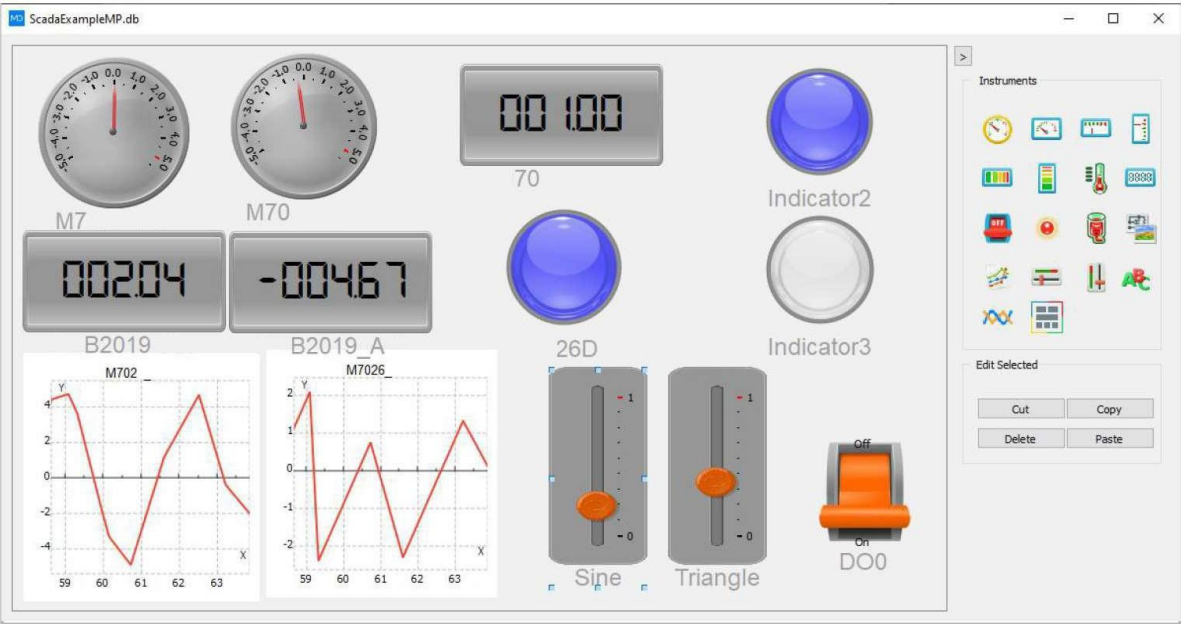
Low Alarm Limit0.00

Use as SCADA Tag

Back to Search

Configure

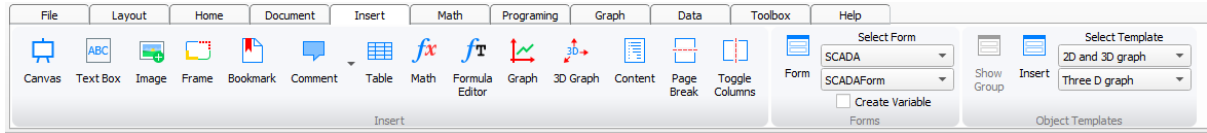
The types of forms shown above are a part of the necessary components needed to create SCADA applications in MatDeck. The Image below is an example of SCADA applications in MatDeck look like.



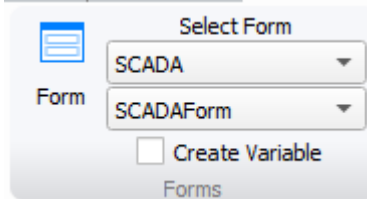
Starting SCADA applications in MatDeck

The only thing we will need to do is to open the SCADA Tag Manager Form. This form can be opened directly in the document or used outside of the document.

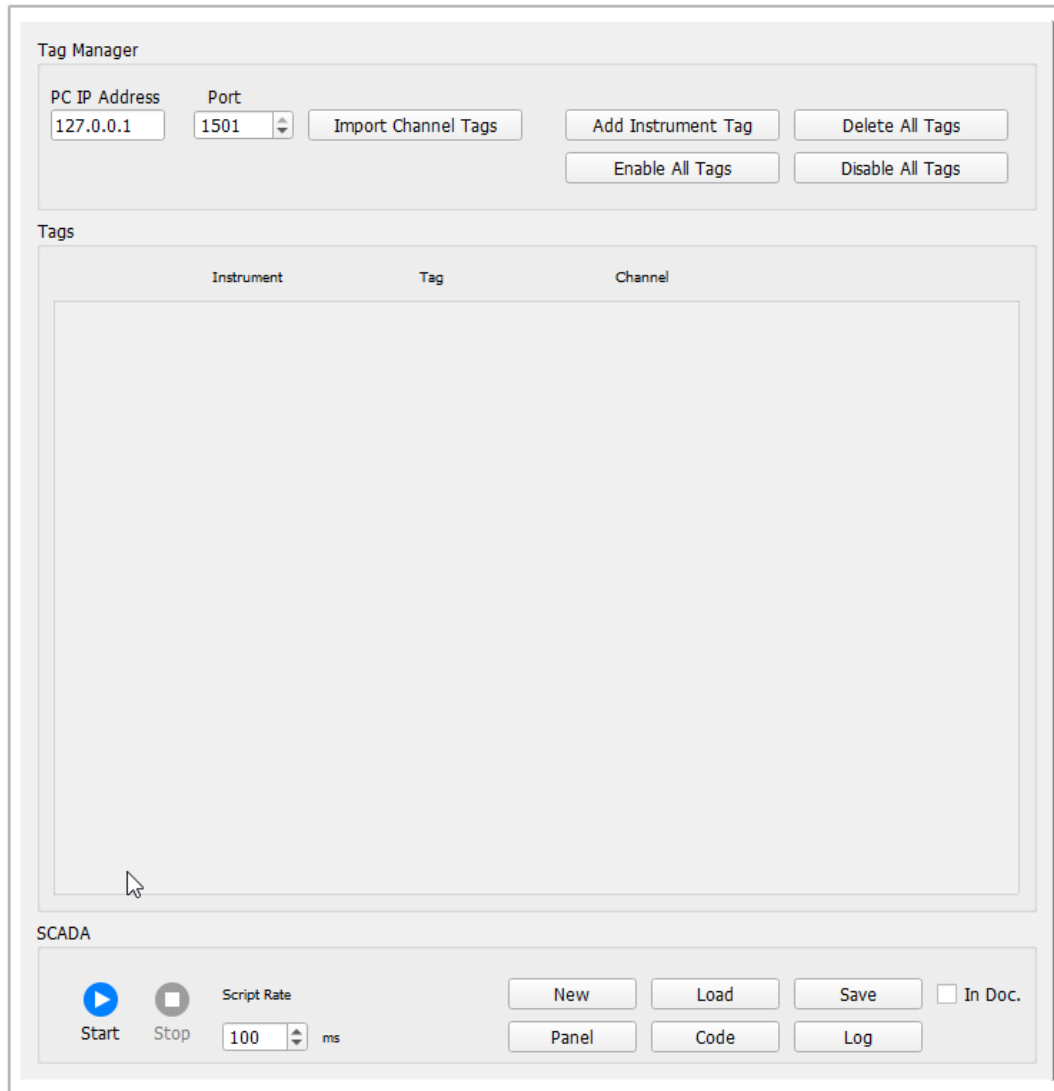
To open the form in the document, go into the Insert ribbon and on the right hand side you will see the Form area.



From there select the SCADA option in the first drop down menu and click the form button

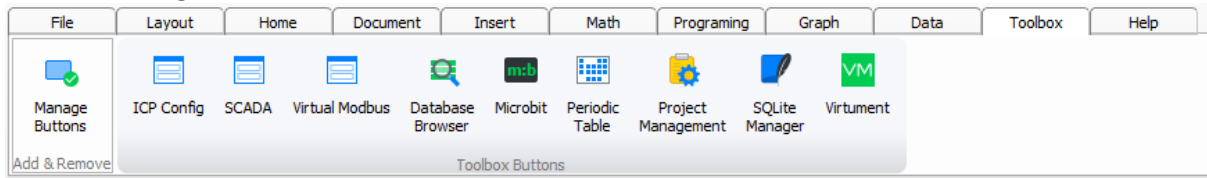


Then all you need to do is click on the document. The form will look like this when first inserted

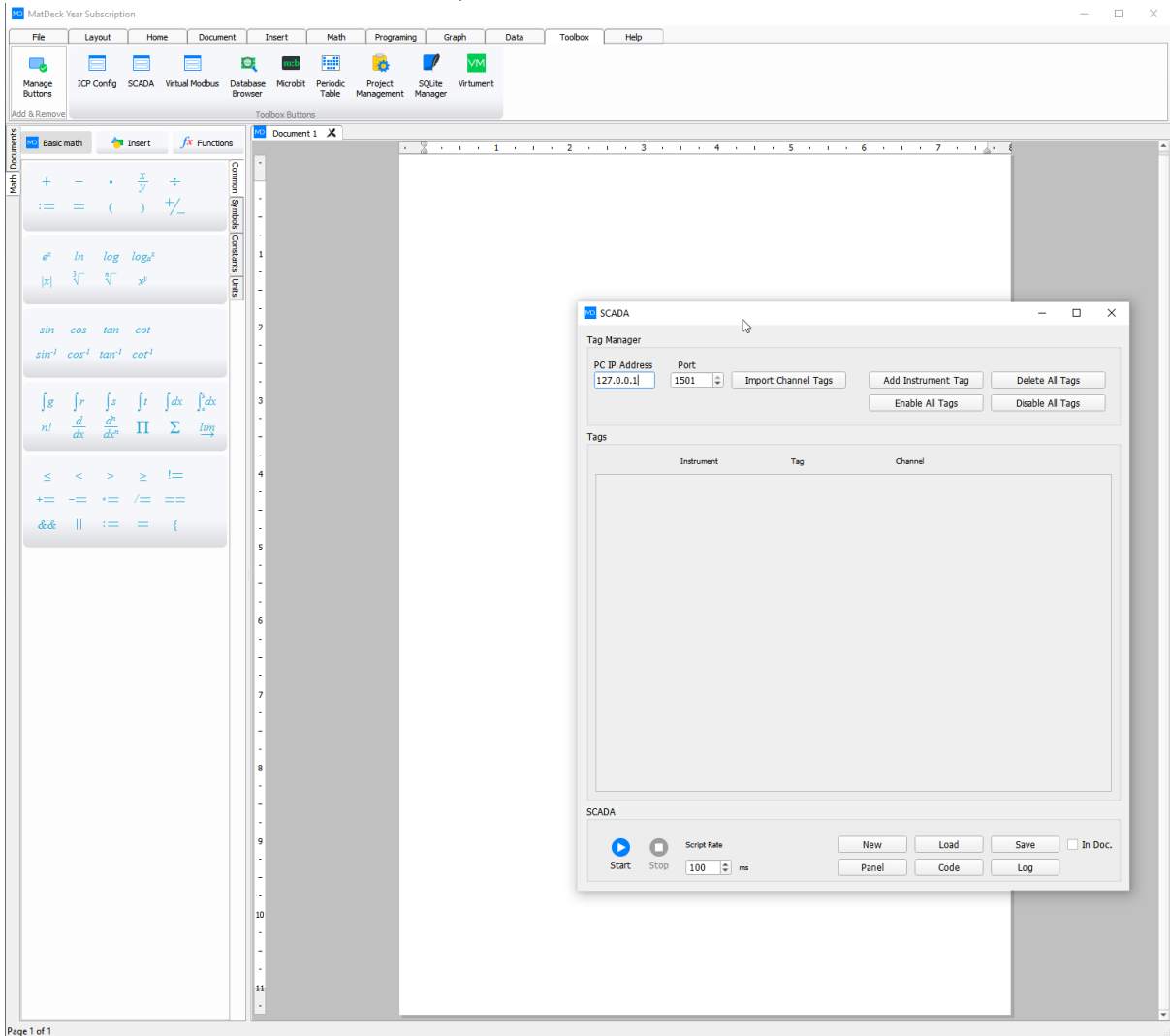
A screenshot of the SCADA Tag Manager form. The form has a title bar 'Tag Manager'. Below it, there are two input fields: 'PC IP Address' with the value '127.0.0.1' and 'Port' with the value '1501'. To the right of these fields are several buttons: 'Import Channel Tags', 'Add Instrument Tag', 'Delete All Tags', 'Enable All Tags', and 'Disable All Tags'. Below these fields is a large table with three columns: 'Instrument', 'Tag', and 'Channel'. The table is currently empty. At the bottom of the form, there is a section labeled 'SCADA'. It contains a 'Start' button (a blue play icon), a 'Stop' button (a grey square icon), a 'Script Rate' field with the value '100' and a unit 'ms', and a series of buttons: 'New', 'Load', 'Save', 'Panel', 'Code', 'Log', and a checkbox labeled 'In Doc.'.

Alternatively, you can open the SCADA Tag Manager form outside of the document, this is done by

clicking the SCADA icon found in the Toolbox tab.

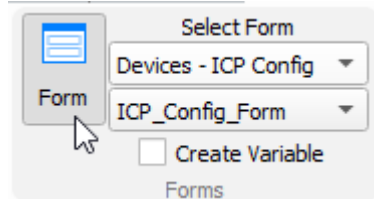


The Form will look like this when first opened.



Using Hardware with the SCADA Toolbox

The first step to using any hardware is to configure it, this is done by using our codeless configuration forms. The configuration forms are inserted just like the SCADA Tag Manager, this means that you will find it in the Form section of the Insert ribbon.



From there you need to choose the correct form for your device, once you have done this, click the Form icon and then click where in the document you would like to add the form.

ICPDAS Config Form - Search Devices

☒ Search MODBUS ☒ Search TCP

Search Devices

No Devices

Search Baud Rates

☒ 9600 ☐ 14400
☐ 38400 ☐ 19200
☐ 57600 ☐ 115200

Search TCP

IP Address

127.0.0.1

Dev. Address

1

Port

502

Dev. Name

7017

Config

IO

Now enter the connection parameter for your device and select your device from the drop down menu. Then choose which AI,AO,DI or DO channel you would like to export for the SCADA, you can choose multiple channels to export. Here you can see what the export option looks like.

ICPDAS Config Form - Search Devices

☒ Search MODBUS
 ☒ Search TCP

Search Baud Rates

☒ 9600
 ☐ 14400
 ☐ 38400
 ☐ 19200
 ☐ 57600
 ☐ 115200

Search TCP

IP Address: 127.0.0.1
 Port: 502
 Dev. Address: 1
 Dev. Name: 7017

Search Devices

Select Device: TCP-127.0.0.1:502, 1-7017

Config
 IO

Modbus Configuration Form

Device Configuration

Reset the I/O settings to the factory default sta
 Reset
 Set

AI Configuration

0

DO Configuration

All

Command History

Clear the 1-ch historical max value of AI0
 Clear the 1-ch historical min value of AI0
 Enable/Disable the AI0 function
 Enable/Disable the AI0 high alarm function
 Enable/Disable the AI0 low alarm function
 Set the AI0 high alarm mode
 Set the AI0 low alarm mode
 Clear the AI0 high alarm status
 Clear the AI0 low alarm status
 Read AI0 high alarm status, when the AI value is higher than the high alarm value, the status becomes 1
 Read AI0 low alarm status, when the AI value is lower than the high alarm value, the status becomes 1
 Read AI0 historical max. value
 Read AI0 historical min. value
 Set the AI0 high alarm value
 Set the AI0 low alarm value
 Set the AI0 range (Type Code)
 Export AI0

You can also do this for any Outputs and not just Inputs.

ICPDAS Config Form - Search Devices

☒ Search MODBUS ☒ Search TCP

Search Baud Rates

☒ 9600 ☐ 14400
☐ 38400 ☐ 19200
☐ 57600 ☐ 115200

Search TCP

IP Address: 127.0.0.1 Port: 502
Dev. Address: 1 Dev. Name: 7016

Search Devices

Select Device: TCP-127.0.0.1:502, 1-7016

Config IO

Modbus Configuration Form

Device Configuration

Reset the I/O settings to the factory default sta: Reset Set

AI Configuration

All Set the AI noise filter 60Hz Set

DO Configuration

0 Enable/Disable the start-up voltage output of DO0 0 Set

DI Configuration

All Set the start-up excitation voltage output of DO0 Set

Export DO0

Command History

Load Save

Now all you need to do is click the Set button and your channel has been exported. You will now also be taken to the IO tab of your form, as seen in the picture below.

ICPDAS Config Form - Search Devices

☒ Search MODBUS ☒ Search TCP

Search Baud Rates

☒ 9600 ☐ 14400
☐ 38400 ☐ 19200
☐ 57600 ☐ 115200

Search TCP

IP Address: 127.0.0.1 Port: 502
Dev. Address: 1 Dev. Name: 7016

Search Devices

Select Device: TCP-127.0.0.1:502, 1-7016

Config IO

	Device	Dev. Ch	Channel Name	Source Channel	Samp. Rate	Range
<input checked="" type="checkbox"/> Enab.	Del. 7016	AI 0	1 7016 AI 0		400 ms	
<input checked="" type="checkbox"/> Enab.	Del. 7016	AI 1	1 7016 AI 1		400 ms	
<input checked="" type="checkbox"/> Enab.	Del. 7016	DO 0	1 7016 DO 0	1 7017 AI 0	400 ms	
<input checked="" type="checkbox"/> Enab.	Del. 7016	DO 1	1 7016 DO 1	1 7017 AI 0	400 ms	
<input checked="" type="checkbox"/> Enab.	Del. 7016	DI 0	1 7016 DI 0		400 ms	
<input checked="" type="checkbox"/> Enab.	Del. 7016	DI 1	1 7016 DI 1		400 ms	

Enable All Disable All Delete All Load Save

Now that the channels are exported all we need to do is click the Import Channel Tags button at the top of the SCADA Tag Manager.

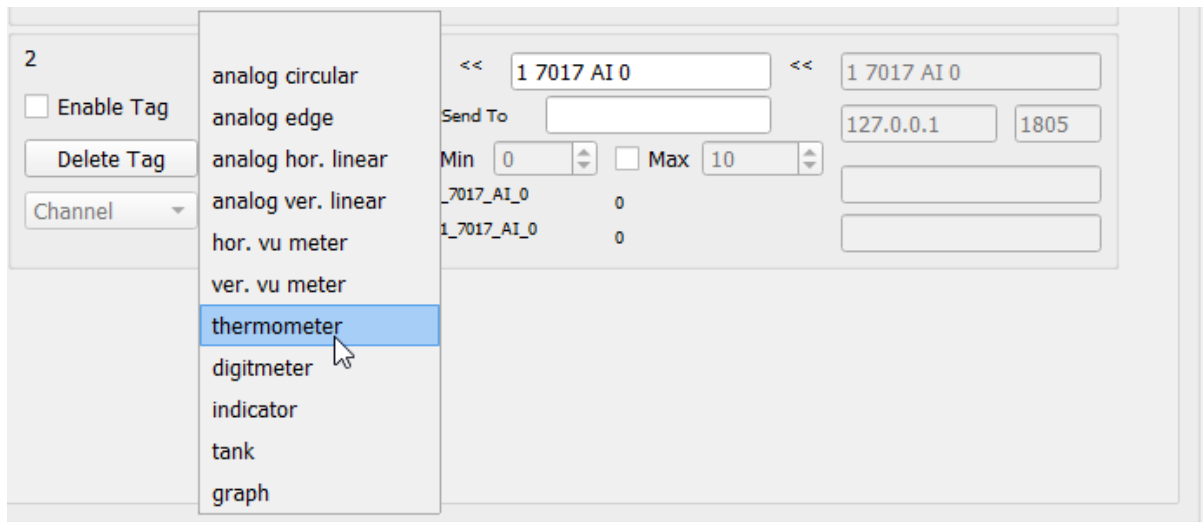
Tag Manager

PC IP Address: 127.0.0.1 Port: 1501

Import Channel Tags Add Instrument Tag Delete All Tags

Enable All Tags Disable All Tags

Once this is done, all the channels will be imported with default instrument for the data they send or receive (slider for sending information and an analog circular for receiving and displaying information). However, this can be changed by using the drop-down menu in the SCADA Tag Manager.



From there the properties can be accessed via the SCADA Panel when an instrument is left-clicked.



This will open a separate window.