







Configuration Manual KTC-IMC 3.4.0



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2 Introduction

IMC: The master control station for managed properties, places all energy devices and data on a common platform for management and monitoring.

Managed properties today consist largely of prefabricated systems with embedded control, monitoring, and communications capabilities. KTC IMC is a unique, powerful tool that gets property systems to work together, placing all managed systems on a single platform, making all their data easily accessible. This means that you can control devices/systems from a wide range of manufacturers rather than be restricted to any one brand.

KTC Integration Master IMC integrates all these systems to get them to cooperate and give you full control of the entire property. KTC integrates all devices and retrieves data from all technical systems on the property.

KTC IMC is scalable to any degree. It is typically installed in a cabinet in the central heating room of a large building with many apartments or offices to integrate the heating/cooling/ventilation systems in that building. It can also remotely control the systems in any number of other buildings from the same location.

Physically the IMC is a small embedded computer with network connections. All communications to programmer, user, PLC:s and other devices are via IP. The IMC doesn't not include a screen so an external tablet, PC OS is needed for programmer and user.

2.1 Manual Conventions

The user manual is built more as a "how to" than as a reference. We go through the different steps in configuring and programming a plant using IMC. When there is user input required the dialog box and screen dumps is included, and a table describing the different fields and their meaning.

Since a lot of fields is generic, when possible there is a section in beginning of each chapter describing general info on the fields that is valid for all parts of the chapter.

There are a lot of fields that is rarely used so since this is not a reference manual they are sometimes excluded. The field description has a layout as below. The R column stands for "Required" and indicates that the field must always have data. The "Ex.data" column is only present in cases where the author finds it necessary to give some hint on good naming conventions, or reasonable values.

Field	R	Description	Ex. Data







2.2 System overview

The picture below describes how a system using IMC typically is built.



In Version 1.0 you can connect M-Bus, Modbus, SRDLink and XMPP devices over IP. More protocols are continuously added. The IMC creates functionality and control between different automation devices. As an extra it also creates a **one** GUI for the user so that he can control all different system for example from a tablet.





3 Getting started

To configure an IMC, you basically need to get it connected to a network, having the software tool "Clayster Management Client" CMT installed on your PC that is connected to the same network.

The end-user rarely needs the CMT, he will instead use the built-in webserver in IMC to access the system. This can be done from a pc, a tablet or a smartphone.

Much of the configuration that you do using the CMT can also be done directly in the web GUI, however not as efficient when doing larger amount of configuring.

Links to section contents:

- Installing the CMT Client
- <u>Start IMC for the first time</u>
- <u>Starting up and Connecting the IMC to the network</u>
- <u>Connect the CMT Client to IMC</u>

3.1 Installing the CMT Client

The CMT Client is the "configuring tool" for IMC and is included when an installer is educated on IMC System at KTC. The installer will receive the software at the education, or upgrades later from ktc.se

The setup file is named Clayster.Management.WPF.Setup.exe.

Run the setup file on the computer that will be used for configuring IMC. CMT Client is a windows tool and needs Windows operating system on a pc.

Follow the instructions given from setup program.



3.2 Start IMC for the first time







There are two ways to connect to an IMC for the first time. The following describes these two different ways.

3.2.1 <u>Alt 1 - By using DHCP (default on IMC network port 1)</u>

Connect the network cable to IMC IP port 1 to an existing network that has a DHCP-server. The IMC is default set to DHCP on IP port 1 and will be assigned an IP address.

If your network has a connection between DHCP-Server and DNS Server you will be able to reach the IMC by hostname. Hostname is default serial number i.e. S10Axxxx. You can find this serial number on the back side of the IMC.

Download the program "Angry IP Scanner". With help of this program you can do a search on all devices at your local IP range that respond to "ping" on port 50100 (default port for communication with IMC). For more information and downloads of Angry IP Scanner see <u>http://angryip.org</u>

By comparing the result of a "scan" before and after IMC connected to the network, you can find your IMC. Normally only IMC will responds on port 50100, and then only the IMC's connected to the network.

Tip: Enable MAC Address in Angry IP. Then you will also see the MAC address of the devices that responds on port 50100. Compare the MAC address in the list with the one on the sticker on the IMC.

Start 🧉	
2	Ports [2]
Select Fetchers Here you can select fetchers for scannir columns. Selected fetchers Ping Hostname Ports <	Available fetchers TTL Fittered Ports Web detect HTTP Sender Comments NetBIOS Info MAC Vendor MAC Address
	OK Cancel

3.2.2 <u>Alt 2 – By using static IP-address (default on IMC network port 2).</u> Connect the network cable to IMC IP port 2. This network card is default set to static IP address 192.168.0.5.

By configuring the network card on your PC to be in the same range (e.g. 192.168.0.10), you can connect directly to your IMC.





3.3 Connect the CMT Client to IMC

When starting the CMT Client the dialog below will be displayed. It allows you to connect to the IMC and start configuration. Once you have connected it will be easier to reconnect since the connections are saved under "recent connections"

😔 Login	_	. 0	23
Recent Connections •	😤 Res	set passv	vord
Connection name:			
IMC local			
Work area:			
		6	
Theme:			
Gray			•
Use current windows user for logon			
User name:			
Admin			
Password:			

Direct to server			
Through switchboard for server cluster			
Host:	Po	ort:	
192.168.0.34	50	0100	
Redirection possible among clustered servers	;		
ОК		Cance	el 🔹

Field	R	Description	Default on IMC
Connection Name	R	Simpler name than IP to remember	
User	R	User name	Admin
Password	R	Password	Admin
Host	R	Hostname or IP-Address of IMC.	
Port	R	Port number to communicate on	50100
Direct to Server	R	Always use this for IMC	
Work Area		If you have saved a file with configuration of your workspace you can load this here.	

Once connected the screen will look as below. Then everything is ready to start configure....

	D.	4 🗎															ΣZ
	Genera	i Imj	port	Comma	inds	Metering	Mor	nitoring									
			1			*	¥,	A			曲	6		10		Ø	
Data Source	View	Мар	Add	Edit	Grid Edit	Remove	Add	Edit	Search events	Sign Errors and Warnings	Search	Display in Details	Find in tree	Find in map 🔻	Tools	Option	s
	Open			E	dit		Comr	ments	Obj	ect events		Fin	t				
																	<
]																	





3.4 Access IMC through web interface.

Connect by opening a browser and enter the IP address or the name of your IMC followed by the port number: 8080. Fill in the username and password and click "OK.

Ansluter	+
€ 3217.210.47.221:8080	
🖉 Mest besökta 🗌 Kom igång 🗌	Förslag på webbplatser 8 Google 💭 Seneste radar-animation 💭 WebSlice-galleri

IMC is loading...

×
Användarnamn och lösenord efterfrågas av http://217.210.47.221:8080. Platsen meddelar: "Home Arena"
Admin
•••••
OK Avbryt





4 Connecting devices

This section for the installation engineer and describes how to configure and connect to different devices using different protocols.

All device configurations are done in the *topology*. The topology is the network of devices that IMC controls. To access the topology, select datasource – metering – topology as shown in picture below.



Once topology is opened it will get a tab and you access it by clicking on that tab.

This chapter is divided into some general information and then one section for each protocol available at writing time. The number of protocols is continually extended, and will be described in future versions of this manual.

Link to sections on how to configure the topology

- <u>General information on topology</u>
- <u>ModBus</u>
- SRDLink
- <u>Mbus</u>





4.1 General information on topology

On an IMC the standard topology has the following "top" nodes.



Alarminfo - Special node that provides functionality for Sum alarms for all other nodes.
Mbus - All Mbus devices connected to the system will be added to this node
Modbus - ModBus devices
SRDLink – KTC SRDLink Devices.
Object – Integration function and calculations

When adding new nodes just select the node that you want to add a device or node under, right click and select "add". Depending on where and what you want to add a dialog box will appear. However many of the fields is similar between different objects that you add. A Dialog box similar to the one below will appear.

	0	New child to Mbus			Σĭ
Ne	w Node Type:				
М	Bus/IP Gateway				•
Pa	rameter Templates				•
	ID Communication Geography	Colors			-
	ID:				
	Required User Privilege:				
				-	
	Name:				
	Class				
	Gateway			•	
	Lifecycle Phase:				
	Installation			•	
	Enabled				
	Meter Location ID:				
	Meter Number:				
	Revert		ОК	Can	cel





Some fields and tabs in the dialog box are unique to the type of object you want to add, but many fields are identical. This manual will describe the generic fields valid for all objects. More specific fields for a specific type of object are described in the part of the manual that describes these objects.

Tab	Field	R	Description	Ex. Data
Id	Id	R	Unique id for the node. In many cases the system will suggest an id based on the parents id. It is important to have some kind of system for naming nodes/devices.	B01.TA01.AI01 B01.FF01.A60
Required User Privilege				





5 Handling ModBus devices

Modbus is a standard serial communications/ control protocol for use with programmable logic controllers (PLCs). It provides communication between devices connected on buses or networks. Modbus allows for communication between many networked devices. An example is a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.

The protocol defines function codes and the encoding scheme for transferring data as either single points (1-bit, coils) or as 16-bit data registers. This basic data packet is then encapsulated according to the protocol specifications for Modbus ASCII, RTU, or TCP.

Modbus protocol is defined as a master/slave protocol. That means a device operating as a master will poll devices operating as slaves. The master will write and read data from slave devices.

5.1.1 Types of Modbus registers and their usage

- Coils are 1-bit registers, are used to control discrete outputs, and may be read or written.
- Discrete Inputs are 1-bit registers used as inputs, and may only be read.
- Input registers are 16-bit registers used for input, and may only be read.

• Holding registers are the most universal 16-bit register, may be read or written, and may be used for a variety of things including inputs, outputs, configuration data, or any requirement for "holding" data.

5.1.2 ModBus nodes

The below is a typical structure for ModBus Nodes

Modbus Root node

- ModbusGateway
- ModbusNode
 - Coil Register
 - DiscreteInput Register
 - Modbus Group
 - Modbus group
 - Register group
 - Holding Register
 - Input Register
 - Modbus Register Group
 - Coil Register (a digital **read/write** object): Compares read/write with relay.
 - DiscreteInput Register (a digital read object): Digital input
 - Holding Register (an analog **read/write** object): To persist whatever is written.
 - Input Register (read object): Reads analogue values.





5.1.3 Adding new Modbus devices to your topology tree:

Begin with a ModBus gateway.

Right-click the Modbus root node, and select the "Add/Modbus Gateway" option:

Topology × Field Sir	nks			
Topology			μ×	Details Topology
🖃 🧒 Root			^	Display
R Mbus				FF01 (192.10
⊟ 🖅 Mod'	1		_	LA01 (192.1
	View Current Information	1		LA02 (192.1
• F	Search events	Shift+F3		LA03 (192.1
• 🔚 L 👀	Display in Details	Ctrl+D	=	VP01 (172.0
🗉 🎦 L 🚍	Open view			
🗉 🚾 V 🤪	Add	Insert	> 📔 N	Nodbus Gateway
🖻 🖅 Obje 🕵	Edit	F4		
🗉 🚾 A 🍓	Remove	Delete		
• 🖻 🕯 📄	Сору	Ctrl+C		
• • • • • • • • • • • • • • • • • • •	Cut	Ctrl+X		
	Paste	Ctrl+V		
	Move Up	Ctrl+Up	-	•
	Move Down	Ctrl+Down		
ctive Selection: M			uld not	t he loaded from the

On the ID tab:

ID Communication Geography Colors	A unique ld for the node. Can be auto function.
ID:	Description opti
Description:	A freely chosen de will appear in the t
Bldg1-Airhandling	Required User Priv
Required User Privilege:	If empty, all can vi this node (and all i viewed by users ha
Name:	Name requ
LA01	A secondary name
lass:	appears in the tree ID function.
Other	Class requ
ifecycle Phase:	Select the type of
Installation	ColdWater, Gas, El
✓ Enabled	Phase req
Meter Location ID:	-Test: cannot erase
	- Production: cann some com parame
Meter Number:	- Install: all new no
	Enabled opti
	Ena
	MeterLocationId
/ert	ID of the meter loo meter data applica recommended to a is used by enginee

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Id required

e system to use for this created via the Autocreate

ional

escription of the node. It tree.

vilege optional

ew this node. If not empty, its children) can only be aving this Privilege ID.

uired

(string) for the node. It e. Is used in the <u>Autocreate</u>

uired

device. Possible values are: ectric, Concentrator, , etc.

uired

e nodes.

ot erase nodes or edit ters.

odes default)

ional

bles function. Default= true

optional

cation. Is often used in ation to assign values. It is assign a meterLocationId. It ers to locate meters/sensors quest.

MeterNumber optional

Often used in metering apps to assign values.

Suggested naming conventions:

- In general, try to create groups that match the functions in a Modbus unit, typically one • group for each sensor, or for each control function.
- If the unit is to be connected to KTC Scada, try to match SRDLink objects to avoid creating new interfaces at the top level.
- If IMC is serving only one building, use the name of the unit connected: Example: a single building Alarm setting could be named LS01
- If serving several buildings, add some information to identify the building connected. •

Example: If there is a gateway for each building, it could be named ModbusGW-Bldg 6.





Naming convention for IDs:

It is suggested to use **AAxx** where AA is the recommended abbreviation and **xx** is the ModBus address. There might be (for example): a Modbus gateway with an IP-address, and a main module with a ModBus address, and a number of submodules. This naming convention makes it easy to organise them. See chapter 5.3 below.

Note: The ID can be auto-created as a concatenation of node names in the path to the final object. Take this into consideration when

assigning Modbus Names. See Autocreate below.

On the Communications tab:

🕺 I 📀		Properties		-		23
Node Type: Modbus Gateway						
Parameter Templates 🏻 🍟)					•
ID Communication	Geography Colors]				•
Thread Group:						
Host:						
192.168.100.81						
Port Number: 502					:	
					_	
Revert			OK	Cancel	A	pply

ThreadGroup optional

Thread Groups can help performance. Nodes of the same thread group are read using the same thread. If not specified, the node automatically assigns a thread group with the same name as the node ID.

Host required

Host Name or IP Address of the machine or device.

Port required

Port Number to use when connecting to the machine or device. standard for ModBus is 502.

Then add a ModBus Node to the gateway

Note that you can add a ModBus node manually as follows or via the scan function (see ModBus scan).

Often only one on a Gateway, but can be several.

Right-click the Modbus gateway selecting the Add/Modbus Node option:







On the ID tab:

		Prope
ates 🍟		
Scan result	Geography	Colors
Privilege:		
ID:		
:		
	ates in the second seco	ates Scan result Geography Scan result Geography Privilege:

required

Id

A unique Id for the system to use for this node. Can be autocreated via the <u>Autocreate</u> function.

Description optional

A freely chosen description of the node.It will appear in the tree

Required User Privilege optional

If empty, all can view this node. If not empty, this node (and all its children) can only be viewed by users having this Privilege ID.

Name optional

A secondary name (string) for the node. It appears in the tree. Is used in the <u>Autocreate</u> ID function.

Class required

Select the type of device. Possible values are: ColdWater, Gas, Electric, Concentrator, etc.

Phase required

-Test: cannot erase nodes.

- Production: cannot erase nodes or edit some com parameters.

- Install: all new nodes default)

Enabled optional

Enables function. Default= true

MeterLocationId optional

ID of the meter location. Is often used in meter data application to assign values. It is recommended to assign a meterLocationId. It is used by engineers to locate meters/sensors upon customer request.

MeterNumber optional

Often used in meter data application to assign values.



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required

On the Modbus tab:

Properties	•	۰	X
Node Type:			_
Modbus Node			
Parameter Templates 🏾 🍯			•
ID Modbus Scan result Geography Colors			•
Modbus address:			
60		¢	
Singlewrite functionCode:			
Single		•	
Register Word order:			
LSW_MSW		•	
Revert OK Ca	ncel	Арр	ly

Modbus address

Enter the Modbus address from the project

Singlewrite functionCode required

Function code to use when writing to a single holding register.

Options are:

documentation.

- Single
- Multiple

Register Word order

required

Register word order to use when registering 32 bit values.

Options are:

- LSW-MSW
- MSW-LSW

On the Scan Result tab:

<u>0</u> 0	Properties	c	•	X
Node Type:				
Modbus Node				
Parameter Templates	Ū.			•
ID Modbus Scan	result Geography Colors			Ţ
Last scan result:			-	Â.
Scan time: 1/1/0001 Register type: Coil	12:00:00 AM			•
Revert		OK Cancel	Aş	oply

On the Geography tab: Not necessary

On the Colors tab: Not necessary

Scan Result Shows the results of the last scan.

Scan is done by right-clicking on that Modbus node you want to search and select " scan detailed".

Set "Register type ", "Starting address", "Ending Address" and "Maximum quantity per message".

Click "OK" to execute.





Then add a Modbus Register:

You can add a register group to create a group that connects variables in Modbus related to a specific object.

In this example, add a single Register.

Right-click the Modbus node, selecting the Add

option and then the register of choice, in this case, a Modbus Holding Register:







On the Id tab:

Note: At this level of the tree, different nodes can have different functions. The tabs presented in this section of the manual show all possibilities. Therefore, some of the following attributes/tabs might NOT be available to you, depending on the node type you are adding:

Modbus Holding Register	Id	required	
Parameter Templates 🍟	A unique node. Can function.	d for the system be autocreated	
ID Register Geography Colors	Descriptio	on optional	
ID:	A freely cl appears ir	nosen description I the tree.	
LA01.A00.A01.Value	Required	User Privilege	
Description: AI Required User Privilege:	If empty, all can view this node (and all its viewed by users havi		
	Name	optional	
Name: Value	A seconda appears in ID functio	iry name (string) 1 the tree. Is used n.	
Other	Class	required	
Lifecycle Phase:	Select the	type of device. I	
Installation	ColdWate	r, Gas, Electric, C	
Enabled	Phase	required	
Meter Location ID:	-Test: can	not erase nodes.	
	- Producti some com	on: cannot erase 1 parameters.	
Meter Number:	- Install: a	ll new nodes (de	
	Enabled	optional	
	Enables fu	inction. Default=	
Revert	MeterLoc	ationId optional	
	ID of the r	neter location. C	
	apps to as	sign values. Reco	

n to use for this via the Autocreate

n of the node. It

optional

node. If not empty, ren) can only be is Privilege ID.

for the node. It d in the Autocreate

Possible values are: Concentrator, etc.

e nodes or edit

fault).

true =

1

Often used in meter ommended to assign it. Used to locate meters/sensors upon customer request to helpdesk

optional

MeterNumber

Often used in meter data application to assign values.







On the Register tab:

Note: At this level of the tree, different nodes can have different attributes. The tabs presented in this section show all possibilities. Some of the following attributes/tabs might NOT be available to you, depending on the node type you are adding:

0	Prop	Register:	required		
Node Type: Modbus Holding Register		Enter register address. Default addresses are usually specified in unit documentation.			
		Size:	required		
Parameter Templates 🏼 🥡		Select value s	ize, 16 or 32 bi	t	
ID Register Geography Colors		Datatype:	required		
Register: 33329	_	Select registe float)	r datatype (sigr	ned, unsigned or	
Size:		Unit:	required		
16		Select units (°	C, kWH, sec, et	c)	
Datatype:		Offset:	optional		
Unit: C		Enter offset th from collected normally not	hat will be adde d value. Typical used.	ed/subtracted Ily for calibration,	
Offset:		Multiplier:	optional		
0 Multiplier: 1		Example: If a degrees, ente more useable	value is express r a multiplier to number.	sed in 0.1 o process it to a	
Start bit range:		Start bit range	e:	optional	
End bit range:		Select bit rang entire reg)	ge start (1-32) (D=disable (reads	
Enumerationlist:		End bit range optional	:		
		Select bit rang	ge end (1-32)		
		0=disable (rea	ads entire reg)		
Revert		Enumeration	list:	optional	
	_	Add string in a an Enumerati	format (Index= on list.	String) to create	

Note the icon that exports this to the editor if you prefer to work there.





5.2 ModBus scan

You can use the built-in scan function to read the Modbus registers in the Modbus device. Right-click the Modbus Node, selecting the Scan detailed option:

	12	Add Comment	
Topology X Field Sinks Groups		Edit Comments	
Topology	D,	Export Tabbed ASCII	
🗏 🍘 Root	D,	Export XML	
🗉 🚞 Mbus	i)	Import XML	
🗏 🔤 Modbus	X	Perform readout C	tri+K
Netbiter Modbus Gateway (192.168.100.83)	िन्न	Read History C	trl+H
Modbus module (Modbus module)		Read History Standard	Alt+H
Im modbus module test2 (modbus module test	1	Configure object Ctrl+R	eturn
 Im VP01 (172.0.0.1) Ride1-Airbandling (192.168.100.70) 		Scan detailed	
 Implementation (192.100.100.100.100.100.100.100.100.100.10		Set standard id.	
■ I Object		Change lifecycle phase to Test	
🗷 🚞 SrdLink		Change lifecycle phase to Product	ion
		Disable	
		Log message	

				Scan de	tailed	c	-	۰	X
Param	eter Templ	lates 🏼 🎲							•
C	ommunicati	ion							•
	oister type:								٦
H	oldingRegis	ter						•	
Sta	arting addre	255:							
3								¢	
En	ding addres	is:							
1	3							\$	
Ma	ax quantity	per message:							
3	2							¢	
									_
	_						-		
Reve	rt					OK		Canc	el
0				Prope	rties		-	۰	2
de Ty	pe:								
odbus	s Node								
irame	ter Templa	ites 🥡							(
ID	Modbus	Scan result	Geography	Colors	1				•
Lact					-			(623)	
	Scan result								1
C.c.	scan result	1/2014 10:05	44.054						
Sca	an time: 2/2	1/2014 10:05 HoldingRegis	:44 AM						
Sca Reg	n time: 2/2 gister type:	1/2014 10:05 HoldingRegis	:44 AM ster						
Sca Reg Reg	an time: 2/2 gister type: gister 3	1/2014 10:05 HoldingRegis	:44 AM ster						
Sca Reg Reg Reg	an time: 2/2 gister type: gister 3 gister 4	1/2014 10:05 HoldingRegi: 1 3	:44 AM ster						
Sca Reg Reg Reg Reg	an time: 2/2 gister type: gister 3 gister 4 gister 5	1/2014 10:05 HoldingRegis 1 3 7680	:44 AM ster						
Sca Reg Reg Reg Reg	an time: 2/2 gister type: gister 3 gister 4 gister 5 gister 6	1/2014 10:05 HoldingRegis 1 3 7680 1	:44 AM ster						
Sca Reg Reg Reg Reg Reg	gister 3 gister 4 gister 5 gister 7 gister 7	1/2014 10:05 HoldingRegis 1 3 7680 1 1	:44 AM ster						
Sca Reg Reg Reg Reg Reg Reg	an time: 2/2 gister type: gister 3 gister 4 gister 5 gister 5 gister 6 gister 7 gister 8 gister 8	1/2014 10:05 HoldingRegis 1 3 7680 1 1 1280	:44 AM ster						
Sca Reg Reg Reg Reg Reg Reg Reg	an time: 2/2 gister 3 gister 3 gister 4 gister 5 gister 5 gister 6 gister 7 gister 7 gister 8 gister 9 gister 9 gister 9	1/2014 10:05 HoldingRegis 1 3 7680 1 1 1280 0	:44 AM ster						
Sca Reg Reg Reg Reg Reg Reg Reg Reg Reg	gister 1 gister 3 gister 4 gister 5 gister 6 gister 7 gister 8 gister 9 gister 10 gister 11	1/2014 10:05 HoldingRegis 1 3 7680 1 1 1280 0 0 0 0	:44 AM ster						
Sca Reg Reg Reg Reg Reg Reg Reg Reg Reg	gister 1 gister 3 gister 4 gister 5 gister 6 gister 7 gister 7 gister 8 gister 9 gister 10 gister 11 gister 12	1/2014 10:05 HoldingRegis 1 3 7680 1 1 1280 0 0 0 0 1	:44 AM ster						
Sca Reg Reg Reg Reg Reg Reg Reg Reg Reg	gister 12 gister 3 gister 4 gister 5 gister 6 gister 7 gister 7 gister 7 gister 7 gister 9 gister 10 gister 11 gister 12 gister 12	1/2014 10:05 HoldingRegis 1 3 7680 1 1 1280 0 0 0 0 1	:44 AM ster						

Register type:

Select the type of register to search for.

Starting address:

Starting address for individual address search range.

Ending address:

Ending address for individual address search range.

Max quantity per message:

The maximum number of Registers to include per message.





5.3 Recommended naming conventions

The format for naming is **NodeName.NodeName.RegisterName**. It is further recommended to use the same object names as in SRDLink objects. This avoids creating new top level groups and improves performance, particularly if used in connection to KTC-SCADA. The following image shows the names typically used. Consult the KTC-modules guide for the latest updates.







The following image shows how the various identification components are displayed in the tree, and a logical approach to configuring these entries.

Note: the <u>Autocreate</u> option for auto-generating the IDs to be used in the system:

🖻 🏭 Modbus	
🗉 😿 Netbiter Modbus Gateway (192.168.100.83)	🗐 😧 Properties
VP01 (172.0.0.1) Ref 14:00 - 200	Node Type:
 LA01 (192.168.1.234) 	Modbus Input Register
 ■ (2) A21 (A21) ■ (2) A22 (A22) ■ (2) A22 (A22) 	Parameter Templates 🤪
 (a) A23 (A23) (a) A60 (A60) 	1D Register Geography Colors
 I (2) #Larm (LARM) I (2) AI01 GT31 (AI01) 	ID:
Al02 GT81 (Al02)	LA01A60A103.Value
AI03 GT11 (AI03) BV Temp. GEMENSAM (Setting)	Description: Temp. Tilluft
. (2) Max begr (LimitMax)	Required User Privilege:
Temp. Tilluft (Value)	Name:

Summary of recommended naming tips:

- Use the same abbreviations used in the SRDLink module when naming nodes. SRDLink is the software protocol for KTC-specific products. Performance is thus improved, particularly when connecting to other KTC modules such as KTC SCADA.
- If you have variables that don't easily convert to the SRDLink model, you can add each to a random group with any name that makes sense to you.
- Note that the **Description** fields for each node, add visible information to the tree that makes it easy to locate an object for management/trouble-shooting etc. Examples:
 - Include Register addresses in the descriptions of folders that organise ModBus registers. A60 might indicate a folder of airhandling variables at address 60 behind the Modbus gateway.
 - In addition to SRDLink abbreviations, text that indicates usage such as building/apartment numbers, or titles such as Settings, Airhandler etc. are useful in descriptions.

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• To translate a Boolean/int variable to text, use the **Enumeration** list function.

(Properties	
Node Type:		
Modbus Holding Register		
Parameter Templates 🏻 🍟)	\odot
ID Register Geograp	ohy Colors	•
11		÷ 1
Size:		
16		→
Datatype:		
INT		
Unit:		
Offset:		
0		÷
Multiplier:		
1		
Start bit range:		
0		
End bit range:		
0		→
Enumerationlist:		
0=Från		
1=11		
Revert	ОК	Cancel Apply

The value will be shown as text described in the **Enumerationlist**:

Home	Back	Help	₽	KTC Tech Test\Netbiter Modbus Gatew		
				Value :	Från	





5.4 Autocreate

For Modbus objects, you can use Autogenerate to create the final **ID** of the object that is used by the system. This function automatically concatenates the contents of the **Name** fields for all nodes in the path to the final object. The following section demonstrates this.

When configuring the Modbus ID tabs (for gateways or sub-nodes), you must enter something in the **ID** field in order to make the **OK** button available. If you plan to use Autogenerate, you can enter anything you want because it will be replaced when the final ID is calculated. In this example, the gateway ID is anything, the **name** is **LA01** (the SRDLink abbreviation for an air handling unit with the gateway contained). The description is **Bldg1-Airhandling**. It will appear in the tree to inform the user of the unit's purpose. The address of the unit will also appear in the tree from what you enter on the **Communication** tab:

-	Catalina				
abus	Gateway				
_	·				
ID	Communication	Geography	Colors		
-1			· · · · · ·		
ID:					
any	thing				
_					
R	lename descendan	ts			
Desc	ription:				
Bld	g1-Airhandling			 	
Req	uired User Privilege	21			
					•
N					
Nam	ie:				
1.1.4.0	11				





Adding a subnode, you can again enter anything in the ID field and then enter a name in the Name field. This example adds a node named **A60**. The description is also **A60**. This will appear in the tree as A60 (A60) with the description first and name in parenthesis. In this case, A60 is used to inform the user of the unit address behind the integrated gateway (default addresses are usually specified in unit documentation):

: Тур	e:				
lbus	Node				
ID	Modbus	Scan result	Geography	Colors	
_					
D:					
any	thing				
Desc	ription:	scendants			
A60)				
Regi	uired User	Privilege:			
1*					•
	e:				
Nam					

Configure as many levels of sub-nodes as you wish. When you are finished, right-click the Modbus GW or Modbus Node you have added them to, selecting the **Set standard ID** option:









Now looking at the Properties tab of a final object (below, it's Ai (Value): you can see that:

- The node Names are unchanged in the tree
- The **Ids** have now been replaced with the concatenation of node names in the path leading to the final object: In this example, it is **LA01.A60.Ai01.Value** identifies the holding register that contains the Ai value.

i i 🖾 🖬 🕷 🕷 🍋	Properties 🗢				
ata View Man Add Edit Grid Remove	Node Type:	4			
rce Edit Open Edit	Modbus Holding Register	ais Fin			
opology X Field Sinks Groups	Parameter Templates 🎯	•			
Topology					
🗉 🚱 Root	ID Register Geography	• •			
😝 Mbus	ID I	÷			
🖻 🚰 Modbus					
🖲 😿 Netbiter Modbus Gateway (192.168.	PAOLADOWIOTABIDE				
🛞 😿 VP01 (172.0.0.1)	Description:				
Bldg1-Airhandling (192.168.100.70)	Ai				
😑 🤀 A60 (A60)	Required User Privilege:				
🗏 🙋 Ai01 (Ai01)		•			
📄 Ai (Value)	Nama				
@ A22 (A22)	Value	1 6			
🗉 🕼 Object	Tuno				
🖹 🏭 SrdLink	Class:	•			
TESTRIGG (192.168.100.139)	Revert OK Cancel	Analy			
	Merell On Calicel	Apply			





5.5 Auto create AV/DV object nodes

Modbus Input Register, Modbus holding register, Modbus Coil Register and Modbus DiscreteInput Register can auto create an object node with a reference to the Modbus node itself.

Modbus Input Register and Modbus holding register will generate AV objects and Modbus Coil Register and Modbus DiscreteInput Register will generate DV objects.

The new node(s) will be created under systems Object folder with the same name as the Modbus node that contains the selected node and with dash Modbus after the name, e.g. MyModbusNodeName - Modbus

The object node name will have the same name as the Modbus node name. The object id will have the format: *Object.DV.ModbusRegisterId.Modbus*, where ModbusRegisterId is the same Id as the origin Modbus register node.

To create a new object node, right click on the Modbus register node and select "Create AV node" or "Create DV node" depending on what type of Modbus node you have selected (Input/Holding or Discrete/Coil).

🖃 🍘 Root	
🕞 AlarmInfo	
📦 Mbus	
🖃 🚔 Modbus	
🖃 🕞 Labv-COM1122-	1700
🗉 🐻 DUC 👔	View Current Information
10VA	Search events Shift+F3
🔂 AV02	Display in Details Ctrl+D
🕼 Hold	
🖾 мво1 😐	
🔀 мво2 💗	Add Insert
12 MB03	Edit F4
12 MB04 💐	Grid Edit Ctrl+G
🕞 MBOS 🍋	Remove Delete
Lig MBOG	Copy Ctrl+C >
L MBO/	Cut Ctrl+X >
	Paste Ctrl+V
	Move +
	Add Comment
B Modbus_GW	Edit Comments
Coil1	Export Tabbed ASCII
Coil2	Export XML
Discre 🔐	Import XML
Hodii 👔	Execute Job Template
😭 Reg1	Execute Job Template Standard
🕼 Modbus	Perform readout Ctrl+K
🕼 Modbus	Pead History Child
🕼 Modbus	Read History Cli+H F
🕼 Modbus_	Read History Standard Alt+H
Image: Image	Read DAT-file
🕼 Modbus_	Change lifecycle phase to Installation
🕼 Modbus_	Create AV node
🗏 🚔 Object	Change lifecycle phase to Production
🗉 🕡 AT - Object./	Disable 🕨
Carl Chi di anno	DOOLD .

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To create object nodes for all Modbus register items under a Modbus node, select "Create object nodes..." by right clicking on the Modbus node. And click "Yes" on the popup window.

🗉 🔞 Root				
🕼 AlarmInfo				
📦 Mbus 🧃) View Current Information	•		
🖃 🚔 Modbus 🦉	Search events Shift+F3			
🖃 🕞 Laby 🚮	Display in Details Ctrl+D			
= 🖅 [Open view			
Ľ	Add Insert	•		
L P	Edit F4			
с Р 🕅	Grid Edit Ctrl+G			
г Я	Remove Delete			
ē 🕻	Copy Ctrl+C	•		
Ē ୶	Cut Ctrl+X	•		
Ē 💼	Paste Ctrl+V			
۵	Move			
۵	Add Comment			
Ē 🗖	Edit Comments			
1	Export Tabbed ASCTI	•		
	Export XMI			
	Import XMI			
	Everyte Job Template	-		
	Execute Job Template	1		
r 🖷	Perform readeut	Č.		
	Perform readout Ctrl+K			
6	Read History Ctrl+H			
<u>ال</u> ا	Read history standard Alt+H	1		
· · · · · · · · · · · · · · · · · · ·	Configure object Ctri+Return			
(ja 1	Create object nodes		Åre vou su	re? X
1	Scan detailed	۱.	Are you su	
1	Set standard Id		A	turbus and a 2
1 🗐	Read DAT-file	•	Are you sure you want to create object	t value nodes?
1 🗐	Change lifecycle phase to Installation	•		
🗏 🔤 Object	Change lifecycle phase to Production	•		Yes No
🗉 🕼 AT -	Disable	•		
🕞 AV -				

The new object nodes with references under Object -> New folder (in this example DUC – Modbus):

■ DUC - Modbus
 ■ AV - AV01
 ■ Input: AV01
 ■ AV - AV02
 ■ AV - Object.AV.Holdon.Modbus
 ■ AV - MB01
 ■ AV - MB02
 ■ AV - MB03
 ■ AV - MB04
 ■ AV - MB05
 ■ AV - MB05
 ■ AV - MB06
 ■ AV - MB07
 ■ AV - MB08
 ■ AV - MB09
 ■ AV - MB10





6 SRDLink

SRDLink is the software protocol for KTC-specific products. KTC products also supports other protocols but the native protocol is SRDLink.

SrdLinkGateway

- $\circ \quad \text{SrdLinkNode}$
 - SrdLinkObject
 - SrdLinkObjectGroup
 - SrdLinkObject
 - •

6.1 To add a SRDLink device to your topology tree:

Begin by adding a **SRDLink gateway** node:

Topology X							
Topology							
B S Root							
📦 Ala	📦 AlarmInfo						
💇 Sit	щ.				1.		
🛒 Sit	(i)	View Current Information		Þ			
🛒 Sit	0	Search events	Shift+F3				
_	se ا	Display in Details	Ctrl+D				
		Open view		×			
		Add	Insert	•	P	IP Host	
	<u></u>	Edit	F4			IP Network	
	\$	Grid Edit	Ctrl+G		≝	IP Router	
	8	Remove	Delete		ති	Loadpoint	
		Сору	Ctrl+C	×		Serial/IP Gateway	
	S	Cut	Ctrl+X	×	≡ J	SRD Link Gateway	
		Paste	Ctrl+V			Virtual Node	
	a)	Move		×		XMPP Server	



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The ID tab: Enter the ID and Name (often the same).

All A New child to Site #1 D X	Id required
New Node Type:	A unique Id for the system to use for this node.
SRD Link Gateway *	Required User Privilege optional
Parameter Templates ID Communication DAT Files Backup Geography Colors ID:	If empty, all can view this node. If not empty, this node and children can only be viewed by users with this Privilege ID.
NET001	Name optional
Required User Privilege: V Name: NET001 Owner:	A secondary name (string) for the node. It appears in the tree. Is used to inform about usage of the objects.
	Class required
Class: Other Lifecycle Phase: Installation	Select the type of device. Possible values are: ColdWater, Gas, Electric, Concentrator, , etc.
V Enabled	Phase required
Meter Location ID:	-Test: cannot erase nodes.
Meter Number:	- Production: cannot erase nodes or edit some com parameters.
	- Install: all new nodes default)
Revert OK Cancel	Enabled optional
	Enables function. Default= true
	MeterLocationId optional
	ID of the meter location. Often used in meter apps to assign values. It is recommended to be used by engineers to locate meters/sensors.
	MeterNumber optional
	Meter apps can use to assign values.





On the Communication tab: Enter the IP-address and port number to reach the unit, standard port for SRD Link is 10001.

@ @	Properties		ThreadGrou	p optional
Node Type: SRD Link Gateway Parameter Templates ID Communication Thread Group: Host: 192.168.100.139 Port Number: 10001	DAT Files Backup Geography Colors	· · · · · · · · · · · · · · · · · · ·		Thread Groups can help performance. Nodes of the same thread group are read using the same thread. If not specified, the node automatically assigns a thread group with the same name as the node ID.
Line Listener subfolder:			Host	required
Verbose Line Listen	2r			Host Name or IP Address of the device.
Syncronize time			Port	required
				Port Number to use when connecting to the device. Standard for SRDLink is 10001.
			Line listener	subfolder optional
Revert	OK Ca	incel Apply		Enter the name of a line listener subfolder. Leave empty if no line listener is desired.

Verbose line listener optional

	If checked, additional info is provided in the line listener.					
Scan alarms	optional					
	Scans the alarm queue.					
See chapter 7.1 and 7.3 for further						
information regarding alarm setup.						
Synchronize time optional						
	Synchronize times.					





DAT Files tab: This is an alternative for adding SRDLink nodes. See: <u>Create SRDLink nodes via DAT file</u> (Offline configuration)

Backup: Here we can see when the last backup of the PLC is made.

To make a PLC backup, right click on the SRD-Link Gateway and select "Read DAT file". The files will by default be stored under: C:\ProgramData\IMC\DATFiles

Geography tab: unnecessary.

Colors tab: unnecessary.

There are three ways to add SRD-Link devices.

- 1. Scan: automatic scanning of devices. This is the easiest way and requires a minimum of time. This method requires that devices are accessible from the IMC server.
- 2. Import DAT-files: We use this method when we want to prepare the OPC server and not yet have communication to the devices.
- 3. Manually build the SRD-Link topology: This method is the most time consuming and is primarily used to add single objects in a device.





6.2 Create SRDLink nodes via scan option

Right click on the SRD-Link Gateway and select "scan detailed".






Image: Communication Image: Communication Image: Communication Image: Communication	ican detailed		23	Use VER	Default method. Fastest scan but can be unreliable with many devices connected to the bus.
Scan each address individually.				Individual sea	arch
Starting address: 0 Ending address: 248		÷			More time consuming but more reliable with a large number of devices connected.
Timeout: (ms)		\$		Starting addr	ess
Tries:		¢		-	Beginning address for the individual address scan range.
Revert	ОК	Canc	el	End address	End address for individual address scan range.
				Timeout	Timeout in ms for address queries.
				Tries	Number of tries before returning a failure.

Every existing device and object connected to the SRD-Link Gateway will automatically be placed in your topology tree.







6.3 Create SRDLink nodes via DAT file (Offline configuration)

For convenient logistics, you can pre-program a building with an offline configuration. This method allows you to create a SRDLink gateway node with SRDLink devices and objects by importing a DAT file at the gateway level.

DAT Files are created by using the KTC Tool Automate, for more details read the manual for Automate.

Start by uploading your already configured DAT files to the "SRD Link Gateway".

Topology ×			
Topology			
Root AlarmInfo	9I @	Properties 🗆	• X
■ I Site #1 ■ NFT001 (192.168.100.207)	Node Type:		
Site #2	SKD Link Gateway		
🛃 Site #3	Parameter Templates 🏼 🍟		
	ID Communication DAT Files Backup	p Geography Colors	•
	Upload DAT-file: C:\Arbetsmapp\Dat-filer\DUC 11 FF.DAT	ď	
	Revert	OK Cancel (Apply

Right click on the "SRD Link Gateway" and choose "Import DAT".

()		Import DAT			23
Parameter Temp	lates 巓				\bigcirc
Content					•
Importera de	ssa filer:				
DUC 11 FF.D	AT			×	
Add new i	tems			•	
DUC 11 FF DUC 14 Br	.DAT and.DAT				
Revert			ОК	Can	cel





6.4 Create SRDLink nodes/Objects manually

Add a SRD-Link device node to the gateway by right-clicking the SRD Gateway and selecting the **Add/ DUC** option:

	iu requireu
Properties	A unique Id for the system to use for this
Node Type: DUC	node.
	Required User Privilege ontional
Parameter Templates 🔰 🔍	
ID Communication Backup Geography Colors	If empty, all can view this node. If not empty, this node (and all its children) can only be
DUC001	viewed by users having this Privilege ID.
Required User Privilege:	Name optional
Namer	A secondary name(string) for the node. It
DUC001 HVAC	appears in the tree is used to inform about
Owner:	appears in the tree. Is used to inform about
	usage of the objects.
Class:	Class required
Lifecycle Phase:	Select the type of device. Possible values are:
Installation	ColdWater, Gas, Electric, Concentrator, , etc.
Enabled	Phase required
Meter Location ID:	
Meter Number:	-Test: cannot erase nodes.
	- Production: cannot erase nodes or edit
	some com parameters.
Revert OK Cancel Apply	- Install: all new nodes default)
	Enabled optional
	Enables function. Default= true
	MeterLocationId optional
	ID of the meter location. Is often used in meter data application to assign values. It is
	recommended to assign a meterLocationId. It
	upon customer request.
	MeterNumber optional
	Often used in meter data application to
	assign values.

On the Communication tab: Enter the SRD-address and model type of the unit.





After this you can add a **SRD-Link Object/ SRD-Link Object Group**(used to organize the objects) Just right click and chose the type of object you want to add.

On the Communication tab you have to fill in the Object Name and number.

()		Propertie	es					23
Node Type:								
SRD Link Object								
Parameter Templates	6							•
ID Communication	History signals	Geography	Colors					•
Object Name:								
AV								
Object Number:								
1							÷	
Syncronize name v	vith PLC							
Revert				ОК	Cancel]	Арр	ly





6.5 Activate Alarm Poll on SRDLink node

With this optional parameter it is possible to activate alarm poll. No value or 0 will disable the function. Put a number for the interval in minutes that this SRDLink Node (DUC) will be polled. If no alarms are detected, a short alarm scan will be done, looking for sum-alarm of the node. If any alarm is active, a full alarm scan will be done each time in order to detect eventual change of status in the alarm(s). Alarm polling will consume more data which should be considered if using serial communications.

]	Properties			۰	23
Node Type:					
DUC					
Parameter Templates				i	۲
ID Communication Backup Geograph	y Colors				•
Address:					
10				\$	
Model:					
RCU1111-1110					
SerialNumber:					
1810					
Major Version:				•	
•				•	
Minor Version:				•	
r r				•	
Release:				•	
				•	
✓ Enable alarms					
Sum-Alarm Period Time for alarm scan:				•	
Novalue				•	
Self acknow Sum-Alarm Period Time f	or alarm d)				
Set the scan interval time	(in				
minutes) for sum alarm. So disable function.	et 0 to				
Revert		ОК	Cancel	App	bly





6.6 Activate Serial Number Polling on SRDLink Node

This setting automatically updates the serial number on the DUC Node.

Serial Number Polling can be set on SRDLinkNode (DUC) or in Settings. Value is set in hours. 0 or no value is disabled function.



<u>0</u>	Properties		-	23	0	0	Properties		-	23
Node Type:					No	ode Type:				
DUC					S	ettings				
Parameter Tem	inlates			•	P	arameter Temp	plates			
			Ĩ						~	
ID Com	Backup Geography Colors			•		Ports SMT	TP Settings Network Opc UA Server Alarm SrdLink G	uality control		•
Address:				1		Disconnect ti	time (seconds):			
10			¢			30			\$	
Model:						Show ID a	as displayname.			
RCU1111-1	110					Default PLC II	ID when scan:			
SerialNumb	er:					DUC[000]				
1816						Syncroniz	ize alarmqueue.			
Major Versi	on:		_			Import interfa	face:			
4			;						2	
Minor Versi	on:		_			Activate S	SrdNode Communication Alarm			
7			;	-		Carial Number	er Cene Internel (Heure)			
Release:			_			1	er scan interval (Hours):		:	
16			;						•	
✓ Enable a	alarms									
Sum-Alarm	Period Time for alarm scan:		_							
No value			;							
Serial Num	ber Period Time:									
1			;							
Sel Sel	ial Number Period Time rialNoReadInterval)									
Se	et the scan interval time (in			•						
Revert di	purs) for serial number. Set 0 to sable function. OK Cance	21	App	oly		Revert	ОК	Cancel	App	oly

6.7 Connecting KTC device COM1025 using "SCADA-StatusClient" function with IMC.

In the communication product KTC COM1025 there is a function called "SCADA Client Status". This feature enabled communication between COM1025 and former Adepto OPC server without the use of fixed IP addresses. At IMC, we have implemented functionality to be able to support KTC COM1025 fully in the IMC.

The first thing we must do is to add a SRDLink server. This is to allow communication between COM1025 and the IMC server.

Open Data source/IMC/SRDLinkServer.

Add SRDLink Server

ſ	SrdLinkServer ×						
	SrdLinkServer		ų ×	Details SrdLinkS	en	ver	
	🖃 🚞 SrdLinkServ	<u>_</u>		Die	h	ay Name	Туре
	⊞ ≡ ¹ COM102	i	View Current Information	Þ	ł	CP, port 10001)	SRDLink Server
		ah O	Search events	Shift+F3			
		6	Display in Details	Ctrl+D			
			Open view	+			
			Add	Insert 🕨	ĺ	SRDLink Serv	er





😔 📀 Properties	- • X	Name:
Node Type: SRDLink Server		Enter a name for the node
Parameter Templates 🏾 🥡	۲	Protocol:
Communication	-	TCP/UDP (in this case we use TCP)
Namn:		
Protocol:		Port Number:
TCP Rat Number		Enter a valid port number for the
10001	÷	connection to the host machine.
Хтрр		Default for this application is
Add a reference to a XmppServer node to start listen for xmpp messages. Use add or drag and drop."		10001.
Send sensor error response		
Line Listener subfolder:		
DVNodes		
Revert	Cancel Apply	

Those COM1025 devices configured to talk to your IMC server will now appear in the tab **Data source** / IMC / Status Client (COM1025).





IPModemrRootNode	😳 📀 Properties	_ 0 %
	Node Type:	
	IPModem Node	
	Parameter Templates 🏾 🥡	\bigcirc
	ID Content	•
	Name:	
	com1025-test	
	Product:	
	COM1025	
	Version:	
	MAC:	
	00:23:4c:01:08:ef	
	Local IP:	=
	192.168.100.199	
	Public IP:	
	192.168.100.199	
	Port:	
	10001	*
	Last restart:	
	🗌 No date/time 🌲 🔻	
	Update time:	
	2014-12-10 15:34:46 🌲 💌	
	☑ 2014-12-10 15:34:46 🖕 ▼	•

What remains now is to create a reference to Topology tree. We do this by adding a **SRDLink Gateway reference**.

tus client (COM1025)				
IPModemrRootNode	🚳 I 📀	Properties	_ 0	Σ
com1025-test	Node Type:			
SKD-Link-Galeway-COP1025 (192.108.100.1	SrdlinkGateway reference			_
				-
	Parameter Templates			6
	Content			•
	Prérener			*
	SRD-Link-Gateway-COM	1025		
	Select reference			
	R Reat		1	=
	🗉 🚽 SRD-Link-Gi	ateway-1 (192.168.100.199)		
	⊒ ^J SRD-Link-Gi	ateway-COM1025 (192.168.100.199)		
	🗉 🔀 XMPP-TEST			
			,	Ŧ
	Revert	OK	Cancel Ann	olv

Note: This reference replaces any communication settings previously made in Topology / SRDLink Gateway with new ones from the Status client.





6.8 Connecting KTC device using XMPP

In IMC, you also have the ability to connect your devices through XMPP. Connection via XMPP does not require fixed IP addresses and only port for outgoing traffic must be opened (default XMPP port 5222). An XMPP server must be available for this type of communications solution.

Add a new XMPP Server:

Topology 3	×					
Topology						
🗆 🎱 Ro	(j)	View Current Information		+)	
	1	Search events	Shift+F3			
	S	Display in Details	Ctrl+D		9)	
· 🖻		Open view		Þ		
		Add	Insert	•	Ψ,	IP Host
		Edit	F4			IP Network
	8	Grid Edit	Ctrl+G		≝	IP Router
	8	Remove	Delete		ති	Loadpoint
		Сору	Ctrl+C	×		Object Root Node
	S	Cut	Ctrl+X	×	۵	Serial Port
		Paste	Ctrl+V			Serial/IP Gateway
	S	Move		Þ	اھ	SRD Link Gateway
	۴,	Add Comment				Virtual Node
		Edit Comments				XMPP Server







Fill in settings for communication with the XMPP server you are connecting to in the Communications tab:

0	Properties	n 🔍 🗶 Thr
de Type: MPP Server		All
		gro
arameter Templates 🏼 🎧		Hos
ID Communication Features	Identities Commands Entities C	Geography Colors - Fnt
Thread Group:		ma
Host:		Por
xmpp.utv.ktc.se		Ent
Port Number:		tot
5222		÷
XMPP Domain:		XM
xmpp.utv.ktc.se		Na
XMPP Address (JID):		
pan01@xmpp.utv.ktc.se		ser
Password:		XM
•••••		
Trust invalid server certificate	25.	XM
Auto-create account if not a	vailable.	con
Display Heart beats in line list	tener.	Dac
Seconds between reconnection	attempts:	Fas
60	-	🗧 🔰 Pas
		adc

Thread GroupoptionalAll nodes belonging to the same thread
group, will be read using the same thread.

ost required

Enter an IP address or DNS name for the host machine

rt Number required

Enter a valid port number for the connection to the host machine.

XMPP Domain required

Name of the domain hosted by the XMPP server.

MPP Address (JID) required

XMPP address of the client that will perform communication with XMPP devices.

required

sword

Password corresponding to the XMPP address.

Frust invalid server certificates optional

If checked, invalid server certificates will be accepted during connection.

Auto-create account if not available optional

If checked, a new account will be created on the XMPP server. After created, the flag will be cleared.

Display Heart beats in line listener optional

If checked, the line listener will display when heart beat messages is sent to the XMPP server.

Seconds between reconnection attempts

If connection to XMPP server is missing, reconnection attempts will be performed with this interval.





Any valid connections will show up in the XMPP topology:

Topology X
Topology
🖃 🥥 Root
📦 AlarmInfo
🗉 🚽 SRD-Link-Gateway-1 (192.168.100.199)
SRD-Link-Gateway-COM1025 (192.168.100.199)
🖃 🔀 XMPP-Server
🚔 651
XMPP-TEST LAB_FOPettersson
🖄 imc_showoff@xmpp.utv.ktc.se
🖄 jra01@xmpp.utv.ktc.se
NET001
🖃 🛲 1 - RAD-VV-ELPATRON (SRD5301-1301)
🖃 📾 Analogt
🗉 🚞 AQ - Beräkn. värden
🖃 🚔 AV - AV
📦 AV01 - GT01-UTE
📦 AV02 - GT02-RAD
📦 AV03 - GT50-SOLF





6.9 Communication Error

If there is a problem with the communication to an SRD-gateway or an SRD-node (DUC), the unit will be temporary disabled to avoid unnecessary load on the system and communication. After a specified time, the IMC will automatically retry to establish connection with the disabled node. If a gateway is disabled, all SRD-nodes (DUCs) that belongs to the gateway will also be disabled.

6.9.1 Change Lockout Time and number of retries

To change the default time, which is set to 10 minutes for both gateway and node, the file *"KTC.Common.Settings.xml"* can be edited.

In the "C:\ProgramData \IMC\KTC.Common.Settings.xml" file, there are four xml elements to manually adjust times and try for gateway and nodes. If these rows are omitted in the config file, the default times will be used (10 minutes and 4 retries).

- gatewayCommunicationLockoutTime (in minutes) How long a gateway will be disabled, default 10 minutes unless specified.
- gatewayCommunicationMaxErrorTries (number of attempts) Number of attempts that are made before a gateway is disabled, default 4 try if not specified.
- nodeCommunicationLockoutTime (in minutes) how long a SrdNode (DUC) will be disabled, default 10 minutes unless specified.
- nodeCommunicationMaxErrorTries (number of attempts) - Number of attempts that are made before a srdNode (DUC) is disabled, default 4 try if no specified.

Caution! If the XML file is incorrect (spelling error etc.) while loading, topology will be removed at startup!!!

Example:

```
<?xml version="1.0" encoding="utf-8"?>

<Settings xmlns="http://ktg.com/schema/Settings/v1.xsd">
<authenticateClients>true</authenticateClients>
<authenticateClients>true</authenticateClients>
<authenticateClients>true</authenticateClients>
<alarmScanIntervalMinutes>5</alarmScanIntervalMinutes>
<alarmScanIntervalMinutes>
<alarmScanIntervalMinutes>5</alarmScanIntervalMinutes>
<a>dopcServerSettings</a>
</a>
```





6.9.2 Gateway/Node Lockout Icon

If an SRD-gateway or an SRD-Node is disabled by the system, it will have an overlay icon. The picture below shows an example how the icon looks like, a warning triangle.

- 😑 🚞 SrdLink
 - Iabbvägg RCU010

6.9.3 Manual override of lockout

To manually override the disabled node and try to establish connection before the timeout, right click on the disabled node -> Click 'Cancel lockout'. If there is still a communication problem, the node will automatically be disabled again after the retries.







6.9.4 Communication Alarm

Communication Alarm is an alarm activated when an SrdLink Node has communication problems.

	3						
	Id	Status	Ack.	Time			
4	RCU10.DUC010.RCU1	Sensor error	Ackn.	2021-03-17 13:16:46	\checkmark	Ē	

To activate Communication Alarm for an SRDLink node, use settings and click "Activate SrdNode Communication Alarm". After this setting has been activated, restart IMC.



KTC

7 Custom View IMC

The IMC includes two different custom views. These two are the **Alarm view** and **SRDLink view**. The **Alarm view** is used to monitor and acknowledge alarms. **SRDLink view** can be used to monitor realtime values of Object, see when the last backup was taken and activate trend collection on Objects and more.

Both are closely linked to the Topology tree and displays information depending on which node in the tree you have selected.

Custom views are accessed via the **View / Alarms view** alt. **SRDLink view**. A prerequisite for being able to open custom views is that **Topology** is already selected.



Alternatively, custom views can be opened via the **Topology** tree / Open View.







7.1 Alarm view

Alarm view is a list with the possibility to Filter, acknowledge and delete alarms. Alarms are displayed related to the selected node in the topology tree. It means that you will see all alarms in the IMC if you select the top node.

opology X					
Fopology 🕂 🗙	Alarm View				
 AlarmInfo al armInfo al armInfo B March And And And And And And And And And And	Filter ✓ A-Alarm ✓ Acknowledged ✓ B-Alarm ✓ Not Acknowledged ✓ C-Alarm ✓ Active	Show name		C	
	Id	Status	Ack.	Time	
	SRD-Link-Gateway-1.DUC001.AV	05 Hög	No Ackn.	2014-11-25 21:52:09	
	SRD-Link-Gateway-1.DUC001.AV	'08 Hög	No Ackn.	2014-11-25 21:52:09	 Image: The second second
	SRD-Link-Gateway-1.DUC001.AV	21 Hög	No Ackn.	2014-11-25 22:22:10	
	SRD-Link-Gateway-1.DUC001.AV	22 Låg	Ackn.	2014-11-25 22:22:10	
Acknowledging alarm	ns is done by clicking:	\checkmark			
Permanently remove	an alarm is done by clicl	king:			
Refresh the Alarm vie	ew by clicking:				

By clicking on an alarm, you will get more information about the specific alarm.

Topology ×					
Topology 🖡 🗙	Alarm View				
Image: Second system Image: S	Filter A-Alarm V Acknowledged B-Alarm V Not Acknowledged C-Alarm V Active	🗌 Show name		C	
	Id	Status	Ack.	Time	
	SRD-Link-Gateway-1.DUC001.AV0	5 Hög	No Ackn.	2014-11-25 21:52:09	
	SRD-Link-Gateway-1.DUC001.AV0	8 Hög	No Ackn.	2014-11-25 21:52:09	
	SRD-Link-Gateway-1.DUC001.AV2	1 Hög	No Ackn.	2014-11-25 22:22:10	
	sRD-Link-Gateway-1.DUC001.AV2	2 Låg	Ackn.	2014-11-25 22:22:10	
		Låg Låg	Ackn. No Ackn.	2014-12-08 16:17:24 2014-11-25 22:22:10	





7.2 SRDLink view

At the gateway level, it provides information about Backups, current alarm settings in the PLC (click on the PLC name) as well as connection info.

opology 🕂	× SrdLink View
🕘 🥙 Root	Backup info
📦 AlarmInfo	
SRD-Link-Gateway-1 (192.168.100.207)	Name Last backup
🖃 🚟 1 - DUC001 (SRD5301-1301)	1 - DUC001 (SRD5301-1301) 0001-01-01
🗉 🚞 Analogt	Namp SBD5301-1301
🗉 🚞 Digitalt	Version 4.6.03
🗉 🚞 Funktioner	Serienummer 4213
🗉 🚞 IO	DispatchSettingsText Alla larm
🗉 🚞 Regleringar	IP Adress 172.011.001.239
🗉 🚞 System	DHC adress 0
🗉 🔀 XMPP-Server	
	Connection info
	Momentary
	Last connect time: 2014-12-17 10:41:16
	Last disconnect time: 2014-12-17 10:41:48
	Duration: 00:00:31
	History
	Last connect time: 1899-12-30 00:00:00
	Last connect time: 1899-12-30 00:00:00 Last disconnect time: 1899-12-30 00:00:00

At the PLC level, you can see when the last backup was taken. You are also able to activate historical collection of objects (see <u>Chapter 11.4.1 for more information</u>).

Topology ×	
Topology P × S	rdLink View
Topology # x S Topology # x S Alarminfo # Alarminfo # alarminfo Image: SRD-Link-Gateway-1 (192168.100.207) # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt # Image: Analogt Image: Analogt # Image: Analogt	Name Active Count AQ (0) (0) WAY (0) (0)
	AV01 - RT-UTE (0) Value AV02 - IV-RT451 (0) AV03 - IV-RT551 (0) AV04 - IV-RT511 (0) AV05 - VV-RT451 (0) AV06 - VV-RT511 (0) AV07 - VV-RT511 (0) AV08 - FV-RP401 (0) AV09 - FV-RP402 (0) AV10 - FV-RP501 (0) AV11 - IV-SB401 (0) AV13 - VV-SB411 (0) AV13 - VV-SB411 (0)





opology 🕂 🗙	SrdL	ink View	
🛛 🥥 Root 🔶	6	W-1	- 40
📦 AlarmInfo		Values 2014-12-1/ 11:21	.:48
SRD-Link-Gateway-1 (192.168.100.207)		Text	DT_UTE
🖃 🚟 1 - DUC001 (SRD5301-1301)		Tag	RI-012
🖃 🚔 Analogt		Kategori	0
🗉 🚞 AQ - Beräkn. värden		CategoryText	
🖃 🚔 AV - AV		Signalval	AI01va
📦 AV01 - RT-UTE		Värde	24,08 °C
W AV02 - IV-RT451		Utgångsstatus	24,08
AV03 - IV-RT551		Enhet	1
AV04 - IV-RT502		UnitText	°C
AV05 - VV-RT451		Minbegränsning	
AV06 - VV-RT511		Maxbegränsning	
AV/07 - V/V-RT551		Villkor min	0,00
AV07 - FV-RD401		Villkor max	0,00
AV00 - FV-RP401		Max	24,10 °C
W AV09 - FV-RP402		Min	24,05 °C
AVIO - FV-RPSOI		MinMax reset interval	2
W AVII - IV-SB401		MinMaxResetIntervalText	Dag
W AV12 - IV-SB402		Manoverlage MadaTaut	0
W AV13 - VV-SB411		Modelext	Auto
W AV14 - DP-FILTER		Giverfelstatus	1,00 °C
📦 AV15 - DP-PRIMÄR		AlarmSangorStatusTayt	U Fi Iarm
AV16 - DP-CENTRAL		Larmstatus	0
📦 AV17 - MomentanFörbr		AlarmStatusText	Ei Larm
📦 AV18 - Begränsningsnivå		Fördröining	0 sek
📦 AV19 -		Larmprioritet	3
📦 AV20 -		AlarmPriorityText	A-larm
📦 AV21 - IV-RT451(Framl.) LAI		Höglarmgräns	60,00 °C
📦 AV22 - VV-RT451(Framl.) LA		Låglarmgräns	0,00 °C
📦 AV23 -		Larmförregling	
📦 AV24 -		Larmtid	6.06:00:00
📦 AV25 -		Larmdatum	0001-01-01
📦 AV26 -		Tid kvittering	6.06:00:00
AV27 -		Datum kvittering	0001-01-01

On the object level, you will find real-time data for the selected object.





8 Mbus

M-Bus (Meter-Bus) is a European communications standard for the remote reading of gas or electricity meters. M-Bus is also usable for other types of consumption meters. The M-Bus interface is made for communication on two wires, making it very cost effective.

M-Bus was developed, for example, to measure the consumption of gas or water in the home. This bus fulfils the special requirements of remotely powered or battery-driven systems, including consumer utility meters. When queried, the meters deliver the data they have collected to a common master, such as a computer, connected at periodic intervals to read all utility meters of a building.

Other applications for M-Bus are alarm systems, flexible illumination installations, heating control, various sensors etc.

Note that M-Bus provides functions for scanning the network, automatically registering discovered nodes that are connected to the system.

Examples of Mbus devices:

- MBusIPGateway
 - o MbusNode
 - o SVM TBox Mbus Temperature Sensor
 - Westermo AD01
 - Mbus Adapter
 - MBussMaster
 - R232 Master
 - o Sharky 773
 - o Sharky 775
 - Enermet11EVLMBus
 - o PiiGAB900
 - MBusInterface





8.1 Add an Mbus device to your topology tree:

- Right-click in the topology tree where you want to add the new node (here, it is the Root node).
- Select the **Add** option for the correct node-type. In this case, add an **Mbus gateway** to accept the specific Mbus devices you want to connect:

Topology				-	-	GreenMaue Reality GOD Server
B 🕝 Root					-	Innovus MyHome Gateway
Bo	(1)	View Current Info	rmation	۲	-	1P Host
* 12	Œ	Display in Details	Ctrl+D		100	IP Network
• 62:	193	Search	F3		쓰	IP Router
Ho	10	Add	Incort			Klart.se Weather
1 10+	2	AUU	msert		8	Loadpoint
+ 10 SVA	84	Edit	F4		100	MBus/IP Gateway
	•	Remove	Delete			OPC UA Server
I WE LES	D	Copy	Ctrl+C			Pachube Server
ter;	2					Performance Counters
🗉 😰 Tes	2	Cut	Ctrl+X		۵	Serial Port
🖲 😰 Tes		Paste	Ctrl+V		۵	Serial/IP Gateway
I The test	9	Move Up	Ctrl+Up		眉	SRD Link Gateway
· Te:	5	Move Down	Ctrl+Down		-	Temperatur.Nu Server

On the ID tab:

ID:		
Required User Privilege:		
Name:		
Class:		
Lifecycle Phase:		
Installation		
✓ Enabled		
Meter Location ID:		
Meter Number:		
	(DK Ci

required

Id

A unique Id for the system to use for this node.

Required User Privilege optional

If empty, all can view this node. If not empty, this node (and all its children) can only be viewed by users having this Privilege ID.

Name optional

A secondary name (string) for the node. Gives info to users about the node, instead of the id attribute.

Class required

Select the type of device. Possible values: ColdWater, Gas, Electric, etc

Phase required

-Test: cannot erase nodes.

- Production: cannot erase nodes or edit some com parameters.

- Install: all new nodes default)

Enabled optional

Enables function. Default= true

MeterLocationId optional

ID of the meter location. Is often used in meter data application to assign values. It is recommended to assign a meterLocationId. It is used by engineers to locate meters/sensors upon customer request.

MeterNumber

optional

Often used in meter data application to assign values.





On the Communication tab

Ø	New child to FaBo	_ = X
v Node Type:		
Bus/IP Gateway		*
ID Communication		-
Thread Course		
Inread Group:		
Host:		
Port Number:		=
		\$
IP Protocol:		
TCP		•
Verbose Line Listener		
		OK Cancel

Thread Group optional

Thread Groups can help performance. Nodes of the same thread group are read using the same thread. If not specified, the node automatically assigns a thread group with the same name as the node ID.

Host required

Host Name (string) or IP Address of the machine or device.

Port Number required

Port Number to use when connecting to the machine or device. KTC Devices normally connects on port 10003, UDP

IP protocol optional

Specifies the IP protocol to use. Possible values are: TCP (Default), UDP

Verbose Line Listener optional

If true, interpretation information will be made available in the line listener. Default is false.

8.2 Scan meters/devices.

You can scan for either primary or secondary address. Recommended is secondary.

When you have established an M-Bus gateway, you can use the scan function to discover all devices connected on the bus. Right-click the gateway, selecting one of the Scan options.

🖃 🧒 Root .		Edit Comments		
🖃 🔤 Mbus	∎ ‡	Export Tabbed ASCII		×
	∎ `	Export XML		×
🗄 🚞 Modbus	j,	Import XML		×
	\mathbf{N}	Perform readout Ctrl+	к	÷
I I Site		Read History Ctrl+	н	×
E E TEST		Read History Standard Alt+	н	×
🗉 📰 Site‡		Line Listener Alt+F	2	×
	۵	Configure object Ctrl+Retur	n	
		Ping		
		Scan Primary Addresses		×
		Scan Secondary Addresses		×
		Change lifecycle phase to Test		×





Communi	ication	Communica	tion
Timeout: (ms) 1000 Tries: 2		Timeout: (ms) 1000 Tries: 2	

TimeoutoptionalValue in milliseconds. Default is 0TriesoptionalMax inclusive value is 100. Defaultis 3.

Any nodes discovered are automatically correctly placed in the topology tree.

Тороlоду	Ψ×	Detai	ls Topology	
🖃 🍘 Root			Display Name	
🗉 🚾 MBus Test		Ø	MBus Test 31092570	MBus
MBus Test 31092570		Ø	MBus Test 74070041	MBus
		Ø	MBus Test 31092571	MBus
MBus Test 31092571		Ø	MBus Test 0000082	MBus
MBus Test 00000082		Ø	MBus Test 71821615	MBus
		Ø	MBus Test 74070117	MBus
MBus lest /1821615		Ø	MBus Test 00001727	MBus
MBus Test 74070117		Ø	MBus Test 31092568	MBus
🛱 MBus Test 00001727				
MBus Test 31092568				

The example shows 8 meters discovered by scan function.







8.3 Offline devices

To configure devices that is not online, do "Add Mbus Node (General)".

MBus 2	Tact						0	MBus Test 00001727	MBus
	i	View Current Information		•			Ø	MBus Test 31092568	MBus
	A. 0	Search events	Shift+F3				Ø	MBus Test 31092571	MBus
	Æ	Disalau in Dataila	Chilly D				0	MBus Test 71821615	MBus
NG ME	GE.	Display in Details	Ctri+D				Ø	MBus Test 74070041	MBus
M ME		Open view		•			Ø	MBus Test 74070117	MBus
P ME		Add	Insert	•	8	Enerme	t 11EVI	. Heat meter	
ME ME		Edit	F4		B Hydrometer Shar			narkv BR773 Heat meter	
ME ME	8	Remove	Delete		8	Hydron	neter Sh	narky BR775 Heat meter	
	Ē	Сору	Ctrl+C		10	MBus N	lode (G	eneral)	
	100				-			,	
	S.	Cut	Ctrl+X			PiiGAB	900 MB	Bus Adapter	
	Ê	Paste	Ctrl+V		9	SVM T-	Box ME	Bus Temperature Sensor	
	1	Move Up	Ctrl+Up			Wester	mo AD(01 MBus Adapter	
	E	Move Down	Ctrl+Down		-				_

You need either the primary or the secondary adress of the MBus-meter to be able to add it manually to the topology. It is also necessary to select adress mode to primary/secondary depending on the adress you enter.

ID Communication Geography Colors	
Address Mode:	
Primary	•
Primary address:	
No value	▲ ▼
Secondany address:	
No value	\$
Action if invalid recordany address:	
Action in Invalid Secondary address.	
Accept data, and log warning on node	•
Accept data, and log warning on node	•
Accept data, and log warning on node Baud Rate: (0/Empty = Default)	•
Accept data, and log warning on node Baud Rate: (0/Empty = Default)	
Accept data, and log warning on node Baud Rate: (0/Empty = Default) Timeout: (ms)	•
Accept data, and log warning on node Baud Rate: (0/Empty = Default) Timeout: (ms) No value	•
Accept data, and log warning on node Baud Rate: (0/Empty = Default) Timeout: (ms) No value Tries:	
Accept data, and log warning on node Baud Rate: (0/Empty = Default) Timeout: (ms) No value Tries: 3	•
Accept data, and log warning on node Baud Rate: (0/Empty = Default) Timeout: (ms) No value Tries: 3 Maximum number of telegrams:	





9 Copy, backup and restore

You can copy all or part of the tree in the topology and then copy it to another part of the tree or to another project. Right click and select copy (CTRL + C) then paste(CTRL + V).

You can also do a full backup of your IMC project. This is done by first selecting "Backup" tab at the top.



Create

Create a new server backup (With option to copy or move the backup to a client when finished)

Delete Backup

Delete a server backup

Upload

Upload a locally saved backup to the server

Copy to Client

Copy a locally saved backup to the client

Move to Client

Copy a backup file from the server and save on the client and then delete the backup file on the server

Restore

Restore a server backup





10 Creating integrated functionality

IMC places all of your building's systems on a common platform. This enables you to converge the functionality from several different systems to vastly increase their scope and utility.

10.1 Generic info on creating calculation objects.

Much of the integration logic is created in the "Objects" part of topology tree. The different objects that can be added (version 1.0) are:



10.2 Generic info on object references.

The different object types can have references to other nodes as input or output.

For the input reference an Update interval for the node can be set. There is also a setting Readout Timeout (default is set to 0) an asynchronous call will be made, and the node will have a new value next time it is read. It can also be set with a timeout 1-5 seconds, which will make it possible to wait for a "fresh" value on the reference node, which can be useful when running jobs.

de Type:		
ameter Templates	5	
Content		
Reference:		
Tid		
	Select reference	5
ReferenceName:		
Ref01		
Update interval:		
60		\$
Peadout Timeout:		
0		1
(readout Timeout)		
Rea Enable a readtimeout for		
reference, set between 1-5		_
seconds. 0 is disabled	Add new items	
		_
Coefficient:		
1		





10.3 AQ - Analog Calculation Object

The analog calculation object is used to perform a calculation between a number of analog inparameters

It is possible to perform more advanced calculations using a script language.

For more "ease of use" there is also a number of standard calculations included, similar to those in KTC PLC: s. (Min,Max,Average) etc.

In this example, we first create a "object directory node" by right-clicking in topology tree. The node is called "_Examples". The result should similar to below, although only with "Examples" and not all the AQ in the picture.

Topology × Jobs Field Sir	nks							•
Topology 4	×	Detai	ils Topology					Ψ×
🖃 🍘 Root	1		Display Name	Туре	AlarmInterlock	Delay	Priority	-
🕼 AlarmInfo			_Examples	Object Directory Node				_Exan
Mbus	≣	ø	AQ - LA01_AQ01.Value	AQ - Analog Calculation				LA01
🕀 🛱 Modhus		Ē	AQ - LA01_AU01.Value	AQ - Analog Calculation				LA01_
Chiect		Ē	AQ - LA01_AU02.Value	AQ - Analog Calculation				LA01_
		Ē	AQ - LA02_AQ01.Value	AQ - Analog Calculation				LA02
🗄 🔰 _Examples		ø	AQ - LA02_AU01.Value	AQ - Analog Calculation				LA02
		Ø	AQ - LA02_AU02.Value	AQ - Analog Calculation				LA02
🕀 🕞 AQ - LA01_AU(Ē	AQ - LA03_AQ01.Value	AQ - Analog Calculation				LA03
🗄 👘 AQ - LA01_AU(Ē	AQ - LA03_AU01.Value	AQ - Analog Calculation				LA03
🗉 🝺 AQ - LA02_AQ(Ŧ	E	AQ - LA03_AU02.Value	AQ - Analog Calculation				LA03 _{. 🗸}
< Ⅲ ►		•						•

Next step is to right-click _Examples, select add, select "AQ – Analog Calculation Object". You will get a dialog box locking like the one below.



New Node Type:	
AQ - Analog Calculation	•
Parameter Templates 🛛 🤪	•
ID Evaluate Function Variables Geography Colors Help Expression Help	•
ID:	
Required User Privilege:	
	-
Name:	
Class:	
Other	•
Lifecycle Phase:	
Installation	•
✓ Enabled	
Meter Location ID:	
Meter Number:	

The below table describes the fields involved. Suitable name standard might be to number the objects and a description of the purpose. Example AQ01 – Lowest Room Temp.



0 0			Proper	ties						23
Node Type:										
AQ - Analog C	alculation									
Parameter Ter	nplates 🏻 🍟									\bigcirc
				·	Y					
ID Evalu	ate Function	Variables	Geography	Colors	Help	Express	ion Help			•
Function:									_	
Min									•	
Expression										
Unit:										
°C									•	
Neder in 1	· I									
ivodes in	гороюду:								_	
Ref01: AV	01 - VS21-GT1:	1 Tillopp (DU	C-TEST.DUC	001.AV01)					■
Ref02: AV	04 - TA7-GT41	FV (DUC-TES	T.DUC001.A	V04)						
B (03)			- · ·							
Ref03: tes	t2 (test2) (Netb	iter Modbus	Gateway.Mo	dbus mo	dule.te	st2)				
Nodes sele	cted for this fu	nction:							_	
DUC-TEST	.DUC001.AV01							>	8	
DUC-TEST	.DUC001.AV04							>	8	
Netbiter N	Iodbus Gatewa	ay.Modbus m	odule.test2					>	8	
						A	dd new it	ems 🗸		
										•
Revert						ОК	Cano	el	Арр	oly
L						_				





10.4 AT - Average Temperature Object

There is a special object in IMC to calculate average temperature. You can use script functions to perform the same functionality, but the AT Object simplifies this calculation. It is typically used to control heating for a building by using average room temperature instead of heating flow.

Topology ₽ × Details Topology 🖃 🍘 Root Display Nan R AQ - LA02_AU01.Va 🗉 🚞 Mbus R - Object.AT.Frihe 🗄 🚞 Modbus AT - SRD5000_MED 🗉 🗑 Obje . R AV - AV TEST View Current Information Þ 1 🖗 A 🕀 🕞 8 DQ - LA01_Brandsu Shift+F3 Search events DQ - LA02_Brandsu ø 🗩 🕅 A 👀 Display in Details Ctrl+D DQ - LA03_Brandsu R 🗉 😡 A 🚍 Open view Þ 🔞 C 🍗 Add Insert 🕨 AQ - Analog Calculation 🖗 🛛 🕵 Edit F4 AT - Average Temperature ۵ 😡 88 Remove Delete AV - Analog value 🗉 🚞 SrdLi C Copy Ctrl+C DQ - Digital Expression R Cut Ctrl+X DV Digital value

Create an AT Object by adding this to objects in topology.

Next step is to select the room sensors and set the parameters on the Function Tab

U	Function Geo	graphy	Colors	
Min	mum number of	values (DK:	
0				
Rem	ove highest cou	nt:		
0				
Rem	ove lowest coun	t:		
0				
Unit				
Mar	es in Topology:	:		
NO				
Noc	es selected for t	his funct	ion:	





Minimum Number of Values OK

To avoid controlling when many sensors are lost, it is possible to set minimum number of sensors. If less sensors then minimum, the average will be "sensor error"

Remove Highest Count

If a number > 0 is entered, the algorithm will exclude the x highest temperatures from average calculation, where x is the number entered,

Remove Lowest Count

If a number > 0 is entered, the algorithm will exclude the x highest temperatures from average calculation, where x is the number entered,

Unit:

Normally select °C here.

Nodes in Topology

Select the temperature sensors to include in calculation here,

10.5 AV - Analog Value Object

Used to create analog alarm from third party devices (eg Modbus). See Section 8.1 for more information.

10.6 DQ – Digital Expression Object

Similar to the AQ object but used for digital signals. Expressions are made using AND/OR commands.

Expression Help

The following examples has three namned boolean values, v1, v2 and v3.

Logical Or writes as OR, ELLER or || $_{v1\,\parallel\,v2}$

v1 ELLER v3

Logical And writes as AND, OCH or && $_{v1\,\&\&\,v2}$

v1 AND v3

Logical Exclusice Or writes as XOR $v_1 XOR v_2$

Negation writes as NOT or ! !(v1 || v3)





10.7 DV - Digital Value Object

Used to create digital alarm from third party devices (eg Modbus). See Section 8.1 for more information.

10.8 HO - Holidays Object

This node tells if the current day is a holiday or not. Select which nations holidays you want. The readout result will be:

Status

True if the current day is a holiday.

Holiday name

If it's a holiday, the name of the holiday will be presented here.

10.9 LR - Linear Regulator Object

Used to do a linear curve with two breakpoints.

10.10 RW - ReadWrite Object

This node reads value from a node and writes that value to another node. It continuous checks that the values is the same on both sides. The input and output of this node is configured by its child nodes. No parameters to be set on this node.

10.10.1 Node Reference Input

The value of this node represents the input value. If more than one node is added, the sum of all nodes will be the input

10.10.2 Node Reference Output

The output node is the node which this node writes to. The value of this node will always be the same as the input to this node. On the reference properties fields can be selected which shall be written.

9	Properties	
Node Type:		
Output		
Parameter Templates		U
Content		•
Reference:		
Object.AV.AV_RW		
		Select reference 👻
ReferenceName:		
Out01		
Update interval:		
60		:
Readout Timeout		
No value		:
Resolution:		
1		
Read these fields.		
Manual		×
		Add new items 🕑
Coefficient:		
1		
Revert		OK Cancel Apply





10.11 ST State Object

10.12 ST State Sequence Object

10.13 SU - SunTimes Object

This node calculates the sunrise and sunset for a specific position. Enter the longitude and latitude for the position. The readout result will be:

Status

True if the sun is up.

Sunrise

Timepoint for the sunrise the current day.

Sunset

Timepoint for the sunset the current day.

10.14 TM - Thermostat Object

Used to do thermostats function with on and off- time delay.

10.15 TU - Timeschedule Object

Time schedule with a free number of periods. Add a TimeSchedulePeriod Node for each period. The result is the combined result of all periods. If one or more period is evaluated to true, the readout result of this node will be true.

Auto

All periods are evaluated, and the readout result will be the evaluated result.

True

Readout result is always true.

False

The readout result is always false.





11 Reading data from IMC

There are different ways for IMC to expose data to other computer systems, like Scada, information panels, mobile apps, etc.

11.1 OPC-UA

Described under Connecting to KTC Scada.

11.2 Fast API

Fast API (Fast is a short Swedish for estate) is a standardized web API (rest) developed by Swedish estate owners to facilitate handling of building data. KTC has implemented a subset related to meter readings and consumption data.

Nodes are defined by the setting Meter Location ID.

Operator must define where to find meter and consumption data. This is done in settings, in the tab for Fast API:

0	0				Proj	perties						23
No	de Type:											
Se	ettings											
Pa	rameter	Templa	tes									•
	Ports	SMTD	Settings	Network	One IIA Server	Alarm	SedLink	Quality control	East AD	1		_
ſ	Ports	SIVITE	settings	Network	Ope of Server	Alarm	STULINK	Quality control	rast APT			Ť
	Fieldsin	ik to rea	d consump	otion data:								
	HourV	alues									•	
	Consur	nption fi	eld names									
	Consu	mption*										
	Consur	nption p	eriod:									
	Hour										Ŷ	
	Fieldsin	ik to rea	d meter da	ita:								
	Localh	ost									•	
	Reading	g field n	ames:									
	Value											
F	Revert							ОК	Cancel		Арр	oly



12 Creating IMC Alarms and Trend Data

12.1 How to set up polled Alarm using AV/DV Objects

To create polled alarms, we use the AV / DV objects (for SRDLink alarm see further down in this manual). First a physical Object (eg Modbus objects) needs to be linked to an AD / DV Object. After this you have to set the alarm options via the "Alarm" tab described below. Via the "Evaluate" tab it's possible to set the time for the polling interval (default is 60sec).

💿 💿 New child to Object	- e X	Priority	required
New Node Type:			Off, A,B or C
AV - Analogt värde	•	Delay	required
Parameter Templates 🌍	\odot		Time delay for the alarm.
ID Evaluate Content Alarm Geography Colors	•		
Alarm Settings: Priority:		AlarmInterle	ock optional
B Delay:			Ability to connect an object to use for interlock of the alarm.
00:00:00 AlarmInterlock:			
	Select reference	Self acknow	ledge alarm optional
			(AutoAcknowledge) If the alarm
Self acknowledge alarm			should be autoacknowledged or
Alarm limits:			not.
Low limit:			
High limit:		Low limit	required
100	·	LOW IIIIII	
			Low alarm limit setpoint.
Revert	OK Cancel	High limit	required
			High alarm limit setpoint.





12.2 How to set up polled Trend Data

IMC is able to poll trend data. This is done using a predefined job named "ReadoutMomentary_10min". By connecting objects to this job, you will enable trend on these signals. Objects are added via the "nodes" tab in the "ReadoutMomentary_10min" job. Alternatively, you can drag objects from the "Topology" to the job.

Find	Loois			On	Ontions				
🔍 I 📀		F	roperties					23	
Node Type:									
Readout Job									
- n									
Parameter Templates								•	
		Y	Y	Y	Y	Y	-		
ID Content Node	Execution	Groups	Processors	Sinks	Unit Conversion	Reports		•	
LA01.A60.AI14.Value						×		1	
LA01.A60.AI13.Value						×			
LA01.A60.AI12.Value						×			
LA01.A60.AI11.Value						×			
LA01.A60.AI10.Value						×			
LA01.A60.AI09.Value						×			
LA01.A60.AI08.Value						×			
LA01.A60.AI07.Value						×			
LA01.A60.AI06.Value						×			
LA01.A60.AI05.Value						×			
LA01.A60.AI04.Value						×			
LA01.A60.AI03.Value						×			
LA01.A60.AI02.Value						×			
LA01.A60.AI01.Value						×			
LA01.A60.DI01.Value						×		≡	
LA01.A60.DI03.Value						×			
LA01.A60.DI04.Value						×			
-					Add new i	tems 🗸			
								-	
Revert					OK Can	cel	Ар	ply	
·						_			





12.3 How to set up Alarms for SRDLink devices

Alarms from SRDLink devices are activated in the "SRDLink Gateway" and the "DUC (SRD Link)" by checking the "Scan alarms" box. The IMC will then poll the activated alarms in KTC SRD Link devices.

				A descents	and the second second					-
<u>@</u> @			Pro	perties				-	۰	23
Node Typ	e:									
SRD Link	Gateway									
Paramete	er Templates	<u>i</u>								•
ID	Communication	DAT Files	Geography	Colors						•
Threa	d Group:									
Host										
192.	168.1.5									
Port I	Number:									
1000)1								¢	
Line l	istener subfolder									
Ve	erbose Line Listen	er								
🗹 Sc	an alarms									
🔽 Sy	ncronize time									
Revert)					ОК	Cancel		Арр	ly
		111	* I							

0	0		P	roperties			۰	23
No	ode Type:							
D	UC (SRD Link 2)							
-								
Pa	arameter Template	s 🥡						•
	ID Communica	tion Geography	Colors					•
	Address:							
6	11						\$	
	Model:							
	SRD3211B							
	SerialNumber:							
	Major Version:							
6	1						¢	
	Minor Version:							
	1						ŧ	
	Release:							
	5						 ÷	
	🗸 Scan alarms							
4								
:								
F	Revert				ОК	Cancel	Арр	ly




Note: You can also configure the SRDLink devices to send alarms to the IMC. This requires that a receiver is set up in **SRDLinkServer**. Typically, this receiver address will be set to "0". This is not necessary but will speed up the alarm handling as it will be handled as an event.

aLinkserver X					
rdLinkServer I >	Details SrdLinkServer	Turne	Description	Conver or	ldunen
Im SrdLinkServerRootNode	Display Name	Type	Description	server ac	aress
SKDLink Server (TCP, port 10001)		Properties			<u> </u>
000 - Address hode SKD Link Alarms	Node Type:				
	SRDLink Server				
	Parameter Templeter				
					e
	Communication				▼
	Namn:				1
	BIDLINK SEIVER				
	Protocol:				
	ТСР			•	
	Port Number:				
	10001			\$	
	Хтрр				=
	Add a reference to a XmppServer	node to start listen for x	mpp messages.		
	Use add or drag and drop."				
	Send sensor error response				
	Line Listener subfolder:				
	DVNodes				•
inkServer ×	Revert		ОК	Cancel	Apply
inkServer X	C Details SrdLinkServer		OK	Cancel	Apply
IinkServer × LinkServer ♀ × ■ SrdLinkServerRootNode ■ ■ \$RDLink Server (TCP, port 10001)	Details SrdLinkServer	Properties	OK	Cancel	Apply
inkServer × LinkServer	Details SrdLinkServer	Properties	OK	Cancel	Apply I Σ3
inkServer × LinkServer	C Details SrdLinkServer	Properties	OK	Cancel	Apply
inkServer × LinkServer	C Details SrdLinkServer	Properties	OK	Cancel	Apply I Σ
inkServer × IinkServer	Revert Details SrdLinkServer Image: Constraint of the server Image: Constraint of the	Properties		Cancel	
inkServer × LinkServer ↓ × SrdLinkServerRootNode I SRDLink Server (TCP, port 10001) ↓ 000 - Address node SRD Link Alarms	Revert	Properties	OK	Cancel	Apply
inkServer × LinkServer	Revert	Properties	OK	Cancel	
inkServer × LinkServer # × SrdLinkServerRootNode SrdLink Server (TCP, port 10001) w 000 - Address node SRD Link Alarms	Revert	Properties	OK	Cancel	
inkServer × LinkServer # × SrdLinkServerRootNode SRDLink Server (TCP, port 10001) € 000 - Address node SRD Link Alarms	Revert	Properties	OK	Cancel	
inkServer × IinkServer # × SrdLinkServerRootNode I SrdLink Server (TCP, port 10001) IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Revert	Properties		Cancel	
inkServer × IinkServer # × SrdLinkServerRootNode I SrdLink Server (TCP, port 10001) IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Revert	Properties		Cancel	
inkServer × SrdLinkServerRootNode SrdLink Server (TCP, port 10001) w 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × IinkServer ‡ × SrdLinkServerRootNode IIII Server (TCP, port 10001) 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × SrdLinkServer	Revert	Properties		Cancel	
inkServer × IinkServer	Revert	Properties		Cancel	
inkServer × IinkServer	Revert	Properties		Cancel	
inkServer × ILinkServer ↓ × SrdLinkServerRootNode I SrdLink Server (TCP, port 10001) 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × ILinkServer ↓ × SrdLinkServerRootNode I = SRDLink Server (TCP, port 10001) 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × ILinkServer ↓ × SrdLinkServerRootNode I SrdLink Server (TCP, port 10001) 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × ILinkServer ↓ × SrdLinkServerRootNode I SrdLink Server (TCP, port 10001) 000 - Address node SRD Link Alarms	Revert	Properties		Cancel	
inkServer × LinkServer	Revert Details SrdLinkServer Image: Content Content Server address: Image: Operation Content	Properties		Cancel	
inkServer × LlinkServer	Revert	Properties		Cancel	





12.4 How to set up Trend Data for SRDLink devices

SRD devices have built-in-trend buffer. At IMC, we can determine which object we want to retrieve history from and save in the IMC database.

There are several ways to activate history on the objects.

- 1. Using SRDLink View
- 2. On each object
- 3. Several at once using the details Topology

12.4.1 Activate Trend Data collection via SRDLink View

Mark the **Topology** tab and select **View / SRDLink View**.







Select the SRD device you want to activate Trend Collection on. In SRDLink View window, you will now get the option to enable collection of history on each individual object. This is done by expanding the object and then tick the Value box.

Topology ×		
Topology # ×	SrdLink View	ф ×
Topology X ■ © Root ■ Object ■ Site #1 ■ Netrol (192168.100.207) ■ I - STATKRAFT (SR05301-1301) ■ Asalogt ■ Digitat ■ Funktioner ■ To ■ Regeringer ■ System ■ System ■ Site #2 ■ Site #3	Sidlink View Backup info Last backup: 2014-12-05 History Name Active Count AV01 - RT-UTE AV01 - RT-UTE AV02 - IV-RT951 AV04 - IV-RT951 AV05 - VV-RT951 AV05 - VV-RT951 AV06 + IV-RT951 AV07 - VV-RT951 AV07 - VV-RT951 AV08 + IV-RT952 AV09 - VV-RT951 AV11 - VV-St901 AV13 - VV-R501 AV13 - VV-R501 AV13 - VV-St901 AV14 - VV-R5001 AV15 - DP-RIMAR AV13 - VV-St901 AV14 - DP-FILTER AV15 - DP-CENTRAL AV17 - KomentantPorbr AV17 - KomentantPorbr AV17 - KomentantPorbr AV17 - VV-R4501(Franl.) AV17 - VV-R4501(Franl.) <tr< th=""><th></th></tr<>	
	AV15 - DP-CRINAR (1) NETO01.DUC001.AV14.Value 2014-12-09 01:00:00 AV16 - DP-CRINARL (1) NETO01.DUC001.AV14.Value 2014-12-09 01:00:00 AV17 - MomentanFörbr (1) NETO01.DUC001.AV14.Value 2014-12-09 01:00:00 AV18 - Begränsningsniå (1) NETO01.DUC001.AV14.Value 2014-12-09 01:00:00 AV19 - (0) NETO01.DUC001.AV14.Value AV20 - (0) NETO1.DUC001.AV18.Value AV21 - IV-RT451[Franl.] LABM (0) NETO1.DUC001.AV18.Value	
	AY23 - (U) AY24 - (D) AY25 - (D) AY26 - (D) AY27 - (D) AY28 - (D) AY29 - (D) AY30 - (D)	•

12.4.2 Activate Trend Data collection manually on every object

Select the object you want to activate Trend Collection on through the Topology tree and select Edit (F4). Select the tab "History signals" and the Add New Items "Value".

opology	ų×	Details Topology	
🗉 🥥 Root	^		
📦 AlarmInfo		al a Properties Π Β Σ	53
📦 Object			
🖃 💇 Site #1		Node Type:	
🖃 🛁 NET001 (192.168.100.207)		SRD Link Object	
🖃 🛲 1 - DUC001 (SRD5301-1301)			
🖃 🚔 Analogt		Parameter Templates	-
🗉 🚞 AQ - Beräkn. värden			
🖃 🔤 AV - AV		ID Communication History signals Geography Colors	
📦 AV01 - GT31	=		h
📦 AV01 - RT-UTE		Read history from these fields:	
📦 AV02 - IV-RT451		Value 🗙	
📦 AV03 - IV-RT551			
📦 AV04 - IV-RT502		Add new items	
📦 AV05 - VV-RT451			
📦 AV06 - VV-RT511		Value	
📦 AV07 - VV-RT551			
📦 AV08 - FV-RP401			J
📦 AV09 - FV-RP402			
📦 AV10 - FV-RP501		Revert OK Cancel Apply	
AV11 - IV-SB401			





12.4.3 Activate Trend Data collection on several objects at the same time

Select the object you want to activate Trend Collection on in the Details Topology. Select Edit (F4). Select the tab "History signals" and the Add New Items "Value". All selected object will now be activated.

	* ^	Deta	Display Name		ID	Type	Object Name Object	Number Syncronize nar	ne with PIC	Clar
Alexandre			AV01 - GT31		10	type	object Name object	Wannoer Syneromize nar		Oth
Alarminto			AV01 - RT-UTE	0	0		Properties		• **	Oth
UB Object		Ť	AV02 - IV-RT451	Pa	ramatar Tamplatar 🔛					Oth
🖃 💇 Site #1			AV03 - IV-RT551	га	rameter remplates 🏢				•	Oth
E NETOO1 (192.168.100.207)			AV04 - IV-RT502							Oth
I - DUC001 (SRD5301-1301)			AV05 - VV-RT451	_	ID Communication His	tory signals	eography Colors		•	Oth
🖃 🕍 Analogt			AV06 - VV-RT511		Read history from these field	lds:				Oth
🗷 🛗 AQ - Beräkn. värden			AV07 - VV-RT551		N. I.				~	Oth
🖃 🔛 AV - AV	=		AV08 - FV-RP401		value				~	Oth
AV01 - GT31			AV09 - FV-RP402		Add now itoms					Oth
📦 AV01 - RT-UTE			AV10 - FV-RP501		Add new items				U I	Oth
📦 AV02 - IV-RT451			AV11 - IV-SB401		Value					Oth
📦 AV03 - IV-RT551			AV12 - IV-SB402							Oth
📦 AV04 - IV-RT502			AV13 - VV-SB411							Ott
📦 AV05 - VV-RT451			AV14 - DP-FILTER							Ou
AV06 - VV-RT511			AV15 - DP-PRIMAR	_						Oth
📦 AV07 - VV-RT551			AV10 - Dr-CENTRAL	R	evert			OK Cancel	Apply	Oth
AV08 - FV-RP401			AV18 - Regränsningsni		NET001 DUC001 AV18	SPD Link Ob	oct AV	19 true		0#





12.4.4 General settings for the retrieval of historical values. Start by opening **Data Source/Metering/Jobs**.

A		D C	3	' 🚔										
a	2	Gene	ral	Ba	ckup	Import		Con	nmano	ds	Meter	ing	Monitorin	g
			ţ,	-	۱	R			*		٣,	×		
Da	ta ce 🕶	View	M	ap •	Add	Edit	Gri Ed	d it	Remo	ve	Add	Edit	Search	Sign Errors and Warnings
Î	CCS	;	Þ			E	dit				Comr	nents	Obj	ect events
	Met	tering	•		Field Ir	nports		÷						
	Sec	urity	Þ		Field P	rocessor	s	Þ						
	Sen	vices	Þ		Field S	inks		Þ						
	Sys	tem	►	۲	Groups	5		Þ						
	Тос	ls	Þ		Jobs			•		Op	en			
	÷	Ē	Site	٩	Topolo	gy		Þ	۵.	Op	en in acti	ive tab		
		P	Site		Unit Co	onversio	n	Þ		Op	en in use	r define	d tab	
			Site	#3										

Mark **ReadHistory** and select Edit.

Topology Jobs X		
Jobs	φ×	Details Jobs
🖃 🔬 JobRoot		Display Name
E 🕰 Readl''		AllSedLinkObjectsWithHistory
(i)	View Current Inf	nformation 🕨
Ra 🖉	Search events	Shift+F3
6	Display in Detail	ails Ctrl+D
	Open view	Þ
	Add	Insert 🕨
S.	Edit	F4







Choose Execution to change the setup for scheduling of the job.

Properties 🗆 🛙 🖸	This job is act	ive for sched	uling required
Node Type: Readout Job	-	If not selecte	ed the scheduler will never
Parameter Templates	Scheduling in	torval type	required
ID Content Nodes Execution Groups Processors Sinks Unit Conversion Reports + IV This Job is active for scheduling Scheduling information Image: Scheduling Image: Scheduling Image: Scheduling	Scheduling in	Specify inter to determin	val type used by the scheduler e next execution time.
Scheduling interval type:	Scheduling in	terval	reauired
Scheduling interval: 1 Start scheduling: 2014-09-26 Stop scheduling: No date/time V		Specify the i to determining instance '2' other of the	nterval used by the scheduler e next execution time. For results in scheduling every type specified(hour, day, etc)
Start time:	Start scheduli	ng	required
Job retries Retry times: 3 Retry type:		Enter the da starts sched used as start	y for when the scheduler uling the job. If empty, today is ting point for scheduling.
Hours v	Stop scheduli	ng	required
Image: Security interval: Image: Security interval: Execution times Last executed: 2014-12-09 01:00:00 Next Execution Time: 2014-12-10 01:00:00		Enter the da scheduling t keeps sched forever.	y for when the scheduler ends he job. If empty, the scheduler ule new execution times
Next Retry Execution Time: None	Start time		optional
Revert OK Cancel Apply		Enter the tir begin(sched start-end tin decide how start of the o	ne of day for the execution to uling is performed during the ne interval, using execution to often). If not specified the day is used.
	Retry times		optional
		Specify the r for erroneou results are r retries will b	number of retries the job does us results. Only erroneous etried. If specified to 0 no ue performed by the job.
	Retry type		optional
		Specify inter determine n	val type used by the job to ext retry time.
	Retry interval		optional
		Specify the i determine n results in ret specified(ho	nterval used by the job to ext retry time. For instance '2' tries every other of the type ur, day, etc)





13 Creating IMC Web GUI

13.1 Creating a slide Show

The building manager accesses the system via a web interface. This interface can be customized to present a view of the functions the manager finds most pertinent to his/her specific application. Included in customization is an opening Slide that presents the functions, readouts, menus etc. that a building manager wants to see immediately upon opening the page.

The following is an example of the web interface that is used by a building manager to monitor the system.

In this view, you can see an example of the opening page with a customized slide show that presents the selectable items specific to the managers primary daily concerns for that building. Note that you can create any number of pages and browse through them upon opening the interface:

		IN 2013-11-21 12:26 Thu
Building 52 Overview	V	
Flow		
Setpoint 39.5 C		
Actual 39.5 C		
Heat sources	- 10	
Peak heat activated: false / off / no		
	c	2
	(
i 0 ≡ 0 ° 0		🖊 4 🔔 0 🐥 3
	Flow Setpoint 39.5 C Actual 39.5 C Heat sources Peak heat activated: false / off / no	Building 52 Overview Flow Setpoint 39.5 C Actual 39.5 C Heat sources Peak heat activated: false / off / no





A slideshow is composed as follows:

Open the IMC/Slide datasource:

	œ		Genera	al Im	port		Comma	ands	Meterin		
		×		R							
	Data View Map Source			A	dd	Edit	Grid Edit	Remove			
		IM	с		•	٩	MBus	•			
		Me	enu Struc	ctures	×.	Ē	Menu	- +			
		Me	tering		×	Ē	Settin	ngs	•		
		Sec	curity		×		Slide		•		
		Services			×		SrdLir	•			
		System			×	6	Trend	lView	•		
		Tools			×	-					

Right-click the root node selecting the Add /Slide Directory Node option:



KTC

_	 	 	

0	Properties	- • X	Header		required	
Node Type:				Header of	the clide	
Side Directory Node]			the shue.	
Parameter Templates 🏻 🍟		$\overline{\bullet}$	Number of col	umns	required	
Content				Number o	f columns, one or two).
Header:				Two colun	nns only available whe	en
Building A				image pos	ition is center.	
Number of columns:			Sort order		required	
No value		÷	Sont order		requireu	
Sort order:				Which ord	ler the header will be	
Image position:		•		displayed.		
Right		•	Image position	•	required	
Scale to fit			inage position	•	reguireu	
Upload image:				Left, right	or center	
			Scale to fit		Optional	
				Scale imag	ge to fit on slide.	
			Upload image		Optional	
				Upload an	image to show as	
				hackgrour	nd in the slide	
				buckgroui		
Revert		DK Cancel Apply				

After this you have to add **SlideHeaderNode** and **SlideNodeReference**.

SlideHeaderNode is a superscription and **SlideNodeReference** is a link to your dynamic object in the topology.

	0	Properties	- 0	23	Text	I	required
No	de Type:						
Sli	de Header Node					lext to display.	
Pa	rameter Templates 🏾 🍯			•	Sort order	I	required
	Content			•		Which order th	e text will be
	Text:					displayed.	
	Temperatur Framledning:						
	Sort order:						
	1		\$				
R	levert	ОК	Cancel App	ly			



9 0	Properties	_ 0	23	Reference		required
Node Type: SlideNodeReference					Enter a node II) specifying the
					reference to a	node
Parameter Templates			•	Menu Name		Optional
Content			•		This name will	, he shown in the
Reference:					manu	be shown in the
		Colordan General Col	i I		menu.	
		Select reference 👻		Read menu n	ame from refer	ence Optional
VS21-GT11 Tillopp			1		Read the menu	name from the
Read menuname from	reference				node reference	2.
Sort order:				Sort order	required	
2				Joit order	required	
Show this fields:			1		Which order th	ie values will be
		Add new items 💌			shown.	
Update interval:				Show this fie	lds	Optional
5		;	:		Dofault field is	Value Horovou
Userlevel write: DRIFT			-		can change it t	o another.
				Undate inter	val	required
				opuate inter	vai	reguireu
					Update interva	l in seconds for this
Revert		OK Cancel A	oply		node.	
				Userlevel wr	ite	required
					Minimum user	level for configure
					node	Sure Combane
					noue.	

A typical slideshow image may look as below.

Home	Back	Help	KTC Tech Test2	👗 Admin	2014-03-12 16:08 Wed
		Buil	ding A		
		Temperatur Framledning		- N	6
		VS21-GT11 Tillopp:	19.41 °C		
		Temperatur Retur:			
		TA7-GT41 FV:	56.51 °C		
					51
					11
				A	
				L'O-C	
				1	-





13.2 Creating a menu

In addition to slideshows, you can create system-specific menus tailored to the end user needs. In the user menu, you can change setpoints, alarm priority, etc.

A menu is composed as follows:

Open DataSource/IMC/Menu:



Start by adding a Menu Directory Node:





				KTC
<u>0</u> 0	Properties		Name	required
Node Type: Menu Directory Node				Name of the node. It appears in the tree.
Content Icon	U			
Name:			Sort order	optional
Sort order: No value		\$		Used to sort the nodes in the tree
Icon: C:\Arbetsmapp\Bilde	er\UNDERCENTRAL.png	-	lcon	optional
				Ability to connect a picture/icon to the Name .
Revert		OK Cancel Apply		

()	Properties	_ 0 X		
Node Type:			Icon	ontional
Wend Directory Node			icon	optional
Parameter Templates 🏻 🍟		\odot		Select picture/icon to upload.
Content Icon		•		
Upload menu icon: C:\Arbetsmapp\Bilder\E	DUC.png	4		

Note: to activate the icons. Choose MenuRootNode /Content and select Show mode: Icon

Node Type: MenuRootNode Parameter Templates		
MenuRootNode Parameter Templates		
Parameter Templates 🏻 巓		
ID Communication Content Geog	raphy Colors	





When you are satisfied with the structure (**Menu Directory Node**) it's time to continue with **Menu Node Reference**. Use the **Menu Node Reference** to link the objects that you have in the Topology tree together with your user menu.

 001 001 001 001 001 		View Current Information Search events Shift+F3 Display in Details Ctrl+D Open view Add Insert	> >	Menu Directory	Node	
		Edit F4	5	Menu Node Refe	erence	
Node Type: Menu Node	Reference	Properties			Reference	<i>required</i> Select the reference to the object you want to show in the menu.
Parameter T	remplate	s 🍯		 ▼ 	MenuName	e required
Reference DUC-TE	:e: EST.DUCC	01.AV01				The name shown in the menu.
MenuNa VS21-G	ame: iT11 Tillo menuna	pp me from reference		Select reference 📀	Read menu	name from reference optional Read the menu name from the node reference.
Sort orde	er: is fields:			¢ Add new items 📎	Sort order	<i>optional</i> Used to sort the nodes in the tree.
Update i 5	interval:				Show this fi	i elds optional
Userleve DRIFT	l write: le config	Ire				Ability to customize which fields to display. Default is Value.
			- 01		Update inte	erval required
Revert			OK	Cancel Apply		Update interval in seconds.
					Userlevel w	rite: required

Minimum userlevel for configure node.

Enable configuration optional

Enable configure node or not.





Example: Configuration as below provides the following web interface.

Menu	3 0	Properties	_	۵	23
Mainbuilding Mainbuilding 003-HVAC D00-VS21 D00-VS21 D00-VS21	Node Type: Menu Directory Node				
 Image: AV01 - V521-GT11 Tillopp Image: O01-AV01 - V521-GT11 Tillopp Image: O00-V522 Image: O00-V523 Image: O00-V524 	Parameter Templates	9			۲
	Content Icon				•
	VS21 Sort order:				
	Icon:			•	

Menu	0	Properties	-		23
🗉 🛱 Mainbuilding					
🖃 🚞 003-HVAC	Node Type:				
□ □ 000-VS21	Menu Node Reference				
🖃 📭 001: AV01 - VS21-GT11 Tillopp					
🕞 001: AV01 - VS21-GT11 Tillopp	ParameterTemplates 🏼 🍟				\bullet
🚞 000-VS22					
🚞 000-VS23	Content				•
🚞 000-VS24					
	Reference:				
	DUC-TEST.DUC001.AV01	1			
			Select reference	•	
	MenuName:				
	VS21-GT11 Tillopp				
	Read menuname from	n reference			
	Sort order:				
	1			¢	
	Show this fields:				
			Add new items	•	
	Update interval:				
	5			1	
	Lleadevel writer				
	OPTET			-	
	UNIFI			•	
	Enable configure				
	Revert	C	K Cancel	Арр	oly



enu		Properties	_ 0
🛙 🕡 Mainbuilding			
🖃 🚞 003-HVAC	Node Type:		
🖃 🚞 000-VS21	SubMenu NodeReference		
🖃 💼 001: AV01 - VS21-GT11 Tillopp			
🕞 001: AV01 - VS21-GT11 Tillop	P Parameter Templates		
🛅 000-VS22			
🚞 000-VS23	Content		
🛅 000-VS24			
	Reference:		
	DUC-TEST.DUC001.AV	01	
			Select reference 💌
	MenuName:		
	VS21-GT11 Tillopp		
	Read menuname fro	om reference	
	Sort order:		
	1		\$
	Show this fields:		
	AlarmHighLimit		×
	AlarmLowLimit		×
	AlarmStatus		×
			Add new items 👻
	Update interval:		
	5		\$
	Userlevel write:		
	DRIFT		•
			,
	Revert		OK Cancel App





Web Interface:

Home	Back	Help		HVAC	
Home	Back Help		HVAC		
					нν
	 VS21				ΗV
	 VS21 VS22				ΗV
	 VS21 VS22 VS23				ΗV
	 VS21 VS22 VS23 VS24				ΗV

Home				*	
			VS21		
		VS21-GT11 Tillopp:	19.42 °C		>

Home			👗 Admin	
		VS21-GT11 Tillop	p : 19.42 °C	\$
		AlarmHighLimit: 1	7.00	Ø
		AlarmLowLimit: 5	.00	Ø
		AlarmStatus: B	Hi Active	





13.3 Creating a TrendView

A TrendView is composed as follows:

Open the IMC/Trendview datasource.



Right-click the root node selecting the **TrendView Serie Node**.

ſ	TrendView × N	/lenu						
	TrendView			Ψ×	Deta	ils Tr	endView	
	🗉 🕅 TrendV	low	PootNodo			Disp	olay Name	Туре
	🗉 🚞 VSC	i	View Current Information		•	VS	01	TrendView Ser
	🗉 🚞 VSC	4 0	Search events	Shift+F3		VS	02	TrendView Ser
		S	Display in Details	Ctrl+D				
			Open view		•			
			Add	Insert	•	E	TrendView	Serie Node

0	Properties		× Name		reauired
lode Type: TrandView Saria Node				Name or	the TrendView
			GranhT		required
arameter Templates 🏼 🍟				ype	requireu
Settings			•	Line/Cur	/e
e:			_		
			Readou	tType Day	required
hType:			, include	crype bay	required
:Type Day:				Select ty	pe of values to read fr
			•	fieldsink	in day mode.
Type Week:				Raw/Hou	ır/Dav/Month
T				1.0.00/1100	
outType Month:			-		
e Min/Max			Readou	tType Week	required
				Colored a	· · · · · · · · · · · · · · · · · · ·
0				Select ty	be of values to read fr
				fieldsink	in week mode.
)				Raw/Hou	ir/Day/Month
ldsink: eldSinkSQLite				1.00/1100	
initia chaur is last					
iutes snown in logview:			Readou	tType Month	required
					required
				Select ty	pe of values to read fr
		OK Cancel A	pply	fieldsink	in month mode.
_		OK Cancel A	pply	fieldsink Raw/Hou	in month mode. ır/Day/Month
,		OK Cancel A	pply	fieldsink Raw/Hou	in month mode. ır/Day/Month
		OK Cancel A	pply	fieldsink Raw/Hou	in month mode. ır/Day/Month
_		OK Cancel A	Use Mir	fieldsink Raw/Hou n/Max	in month mode. Ir/Day/Month <i>optional</i>
		OK Cancel A	Use Mir	fieldsink Raw/Hou n/Max	in month mode. Ir/Day/Month <i>optional</i> d. the Min/Max settir
_		OK Cancel A	use Mir	fieldsink Raw/Hou n/Max If checke will be w	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settin
		OK Cancel A	Use Mir	fieldsink Raw/Hou n/Max If checke will be us	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settin sed.
_		OK Cancel A	Use Mir	fieldsink Raw/Hou n/Max If checke will be us	in month mode. rr/Day/Month <i>optional</i> d, the Min/Max settin sed.
_		OK Cancel A	use Min	fieldsink Raw/Hou n/Max If checke will be us	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i>
-		OK Cancel A	ppy Use Min	fieldsink Raw/Hou n/Max If checke will be us Min valu	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i> e in graph.
		OK Cancel A	ppy Use Min	fieldsink Raw/Hou n/Max If checke will be us Min valu	in month mode. ur/Day/Month <i>optional</i> d, the Min/Max settin sed. <i>optional</i> e in graph.
		OK Cancel A	ppy Use Min Min	fieldsink Raw/Hou n/Max If checke will be us Min valu	in month mode. ur/Day/Month <i>optional</i> d, the Min/Max setting sed. <i>optional</i> e in graph.
		OK Cancel A	ppy Use Min Min Max	fieldsink Raw/Hou n/Max If checke will be us Min valu	in month mode. ur/Day/Month optional d, the Min/Max settir sed. optional e in graph. optional
-		OK Cancel A	ppy Use Min Min Max	fieldsink Raw/Hou n/Max If checke will be us Min valu Max valu	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i> e in graph. <i>optional</i> e in graph.
-		OK Cancel A	ppy Use Min Min Max	fieldsink Raw/Hou n/Max If checke will be us Min valu Max valu	in month mode. ur/Day/Month <i>optional</i> d, the Min/Max setting sed. <i>optional</i> e in graph. <i>optional</i> e in graph.
		OK Cancel A	ppy Use Min Min Max Fieldsin	fieldsink Raw/Hou n/Max If checke will be us Min valu Max valu	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i>
		OK Cancel A	ppy Use Min Min Max Fieldsin	fieldsink Raw/Hou n/Max If checke will be us Min valu Max valu k	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i> Ideick to root date for
		OK Cancel A	ppy Use Min Min Max Fieldsin	fieldsink Raw/Hou h/Max If checke will be us Min valu Max valu k Select fie	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settir sed. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i> Idsink to read data fro
		OK Cancel A	PPY	fieldsink Raw/Hou h/Max If checke will be us Min valu Max valu k Select fie	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settinged. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i> Idsink to read data from
		OK Cancel A	PPY	fieldsink Raw/Hou h/Max If checke will be us Min valu Max valu k Select fie	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settinged. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i> Idsink to read data fractions iew required
		OK Cancel A	eevi Use Min Min Fieldsin Minutes	fieldsink Raw/Hou h/Max If checke will be us Min valu Max valu k Select fie s Shown in logy Minutes	in month mode. Ir/Day/Month <i>optional</i> d, the Min/Max settinged. <i>optional</i> e in graph. <i>optional</i> e in graph. <i>required</i> Idsink to read data fr iew <i>required</i> shown in logview.
		OK Cancel A	PPY	fieldsink Raw/Hou n/Max If checke will be us Min valu Max valu k Select fie s Shown in logy Minutes	in month mode. Ir/Day/Month optional d, the Min/Max settinged. optional e in graph. optional e in graph. required Idsink to read data from iew required shown in logview.







After this you have to connect your node reference (max 4 per TrendView).



Right-click on the TrendView Serie Node and select Node Reference Trend.

	Properties		Reference	requ	Jired
Node Type: Node Reference Trend				Enter a node ID sp reference to a nod	ecifying the e.
Parameter Templates 🤘		۲	Name	requ	uired
Content Reference:				Name shown in gra	aph
		Select reference 🕑	Read menuna	ame from reference	e optional
Name: TA7-GT21 Rum Read menuname from reference	2			Read the menunar node reference.	ne from the
Read this field:					
Color:			Read this fiel	d opti	onal
				Select the field you	u want to read.
				Default is Value.	
			Color	requ	uired
				Select color.	
Revert	0	K Cancel Apply			





14 Connecting to KTC Scada

The IMC has built-in support for OPC UA, which we use when we want to communicate with KTC-SCADA. We use the tool KTC Manager to add a new data source to establish communication with IMC OPC UA. Things to consider is that the OPC UA communicates on port 7000 and that in this case we are using OPC UA Alarms and Trend.

Datakälla
Namn
IMC
Tagseparator
Taggprefix
i
- OPC-UA Sökvän OPC-HA-server
Namn på server i OPC-OA-konfiguration
Topology
OPC UA Alarm OPC UA Trend
OPC UA Användarnamn
OPC UA Lösenord
ManodoTrendAlarmService
Serveradress
•
DCOM-namn (Samma som i Matrikon)
•
Trend & Alarm Insamlingsjobb (från KTC AdeptoOPC till Scada-databasen)
Scada-databas (linked server, dest.)
(Obligatorisk, tomt fält medför att befintliga jobbparametrar tas bort)
OPC Databas
OPC Job Databas
(Valfritt, tomt fält medför att resp. jobbparametrar ej skapas)
· · · · · · · · · · · · · · · · · · ·





15 Creating IMC dynamic flowchart/diagram

Starting with version 1.2 the IMC has support for creating dynamic diagrams. Construction of the diagrams is done using an additional module to the CMT tool called Diagram Designer.

In short, construction of diagrams is done by adding dynamic symbols and value boxes onto an imported background. The background image may be in the format BMP, JPEG, PNG, or TIFF.

More simple drawing functions such as Ellipse, Line, Polygon, Polyline, and Rectangle are available in version 1.2

Dynamic color changes, for example on sensors and fan symbols are made in version 1.2 by using conditions to switch between different static images.

It is also possible to save dynamic object to the Designer library. Some standard symbols are supplied at installation, but the idea is that the user expands this library for their own specific needs.

15.1 How to create a new diagram

15.1.1 The Diagrams tab





Diagrams are used to add new or edit existing diagrams. There is also an opportunity to preview the results of the work done in the "Diagram Designer".

Diagrams tab is opened via the "Data Source / Diagrams / Diagrams".

New diagrams and folders are added as follows:

Topology	Diag	grams ×				
Diagrams	1	Visa aktuell infor Sök händelser Visa i detaljvy Öppna wy	mation Shift+F3 Ctrl+D	•		
		Lägg till Redigera Redigering Rutnä	Insert F4 it Ctrl+G	•	Custom Diagram Folder	

How to preview or view a previously produced diagram via Diagrams View is shown below:



15.1.2 Start Diagram Designer

Open Diagram Designer by right-clicking on the "Custom Diagram" you want to edit and select Diagram Designer.





15.1.3 Adding a background image

In Diagram Designer, right-click on the diagram and choose from the selections below:



) @ Node Type:	Properties		Width	Width of the imported image in pixels.
[Background Image PNG				
	Parameter Templates	6		Height	Height of the imported image in pixels.
	General				
	Width:		•	File Name	File name of the image.
	Height: 600 File Name: UC		•	Upload new can upload a specified abo	image file If checked, you new image file to the location ove.
	Upload new image	e file		File to uploa location spec	d File to upload and save to the cified above.
	C:\Arbetsmapp\IMC	\IMC Flödesbilder\Bilder Manual\UC.png	6		

15.1.4 Create a diagram link

Start by dragging a link symbol from "Libary" or create a new symbol that you want to use as a link. Alt.1





Right click on your symbol and select Add / Diagram Link.



Select the diagram you want to create a link to.



Alt.2

Make sure the drag / drop behavior is set to "Create Diagram Link".





 Show Grid Lines Show Diagram Objects 	Drag/Drop Behavior •	
Settings	When Noo	le is Dropped on Diagram Object
	✓ Create	e Node Field Connection
	Create	e Node Property Connection
	Create	e Node Control Parameter Connection
	When Dia	gram is Dropped on Diagram Object
	√ Create	e Diagram Link
	Create	e Diagram Popup Window
	Create	e Diagram Popup Window, Relative Size



			test4 in Di	agrams
General				
Paste Cut Copy Delete Show Darkgr	ound nes m Objects	Create Diagram in Diagrams in Library		
Edit	Settings	Create Diagram Containing Selected Objects		
Diagram Tree Diagram Background Image PNG - UC-TE: Diagram Digets Digets Digets Digets Digets Digets	Ŧ×	5 Börvärden	KTC Cont Fjärrvärmece	Diagrams Diagrams Home Skolgatan TEST
ScriptSymbol-Givare-upp				🗈 🚞 Demo Examples
Elabel-ÄV-GT11		Nieus skild as Terrellesses		🗉 🚞 Building A
🖃 🔚 TextEdit-BV-Setting	See 1	New child to ImgHome		🕀 🥅 Karin
	New Node Type: Diagram Link Parameter Templa General Diagram ID: Home	tes 🍯	•	=
			Select reference 文	Diagrams Library Topology

15.1.5 Creating a value box



Start by adding a new Label.

) 🗈 🗟 🖋	2						
General							
Paste Cut C	Copy Delete	Show Backg	iroun ines am O) bjects	Drag/Drop Behavior •	Create Diag in Diagrar	ram Create Diagram ns in Library
Edit			Sett	ings		Create Diagram C	ontaining Selected Objects
Diagram Tree				中 :	×		
🖃 🔝 Diagran	n					8 S	Börvärden
📦 Back	ground Imag	e PNG - UC-TE	ST				
🖃 🚔 Obie	acte						
) View Curre	nt Information	•				
🕀 🗄 🗄	Search ever	nts Shift+F3					
🕀 🗎 🍯	Display in [Details Ctrl+D					
•	Open view		•				
• • •	Add	Insert	•		Label		
<u> </u>	Edit	F4		Con	trols		
	Grid Edit	Ctrl+G			Multi Line Text	Edit Control	
1	Remove	Delete			Text Edit Contr	ol	
	Сору	Ctrl+C	×	Ima	ges		
± 🗧 🕈	🖗 Cut	Ctrl+X	F		Bitmap Image	BMP	
Î	Paste	Ctrl+V			Bitmap Image	JPEG	•
	Move		Þ		Bitmap Image	PNG	
Ĩ.	Add Comm	ent			Bitmap Image	TIFF	
3	Edit Comm	ents			Script Symbol		
0	Export Tabl	bed ASCII	Þ	Sha	pes		4
0	Export XML		Þ		Ellipse		
_					Line		
					Polygon		•
					Polvline		
					Rectangle		
			l	-			

Fill in an ID name under the "ID" and a text string under "text."

<u>@</u> @	@ @
New Node Type:	New Node Type:
Label	Label
Parameter Templates 🏼 🍟	Parameter Templates 🏻 🍟
ID General Text	ID General Text
ID: Label-GT12	Text: ???

To attach a Node to the Label can then be done in two ways.

Alt.1 Right-click on your new "Label" and select "Node Field Connection."



	GT12]					
Caber-	i	View Current Info	ormation	Þ			
	A. 0	Search events	Shift+F3				
	ø.	Display in Details	s Ctrl+D				
		Open view		×			
		Add	Insert	•	Clic	k Actions	
	<u> </u>	Edit	F4			Diagram Link	
	8	Grid Edit	Ctrl+G			Diagram Popup Window	
	8	Remove	Delete			Diagram Popup Window, Relative Size	
		Сору	Ctrl+C	×	Dynamic Connections		
	S	Cut	Ctrl+X	×		Node Control Parameter Connection	
	È	Paste	Ctrl+V			Node Field Connection	
)iagram Details		Move		×		Node Property Connection	
	鞫	Add Comment			_		

Symbol Property will in this case be Text. Select the node you want to be displayed, and finally which field on the selected node to be displayed.

0	New child to Label-GT12			Σ3
ew Node Type:				
lode Field Connection				•
Parameter Templates 🏻 巓				•
General				•
Symbol Property:				-
Text			•	
Node ID:				
SRD_LINK_Gateway_192.1	168.100.207.DUC001.AV01			
	Sel	lect reference 👻)	
Field:				
			- I	





Select the node that you want to connect with the "Label" by dragging the Node from the Topology tree. Symbol Property will in this case be Text and finally select the field to be displayed.

Diagram Tree 4	×	Rönördan	KTC Control	Topology	
Image: Source of the sector of the			■ We Rot @ Warnin @ Warnin @ Dependence @ Dependence @ Dependence @ Sediana @ We Sediana @ We Sediana 0 We Sediana	Fo DOMAIN OF SERVER HERE 	
₩ Label-GT12		New Node Type: Node Field Connection Parameter Templates General Symbol Property: Text Node ID: SSED LWK Chargers 192	New child to Label-G112	· · · ×	(2) AV04 - IV-RT502 (2) AV05 - (2) AV05 - (2) AV07 - (2) AV07 - (2) AV08 - (2) AV09 - (2) AV10 - IV-RF501 (2) AV11 - IV-S5401 (2) AV12 - IV-S5402 (2) AV13 - (2) AV14 - (2) AV15 - (2) AV15 -
Diagram Details		Field: Value	Select re	eference 💌	

15.1.6 Creating a new dynamic symbol

Dynamic color changes, for example on sensors and fan symbols are made in version 1.2 by using conditions to switch between different static images.

Add a "Script symbol"





Enter an ID that will harmonize with the symbol to be created.

(1)	Properties		23
Node Type: Script Symbol			
Parameter Templates 🏼 🍃			۲
ID General			•
ID: ScriptSymbol-Givare			

Also enter the width and height of your symbol in the General tab.

۱ 💿 ا	Properties		23
Node Type:			
Script Symbol			
Parameter Templates	6		۲
ID General			•
Width:			1
20		\$	
Height: 42		\$	

Add the static images to be used in the symbol. Mark your new Script Symbol and select/add State images.

0	Properties	_ 0
ode Type:		
itate Image PNG		
'arameter Templates 🏻 🍟		
General		
State Number:		
0		÷
Width:		
20		÷
Height:		
42		÷
File Name:		
Givare-vit		

State image 1



0	New child to ScriptSymbol-Givare	۵
New Node Type:		
State Image PNG		
Parameter Templates	i	
General		
State Number:		 •
1		 •
Width: 20		 \$
Height:		
42		¢
File Name:		
Givare-röd		
Givare-röd	file	
		- · ·

State image 2

After this, we want to determine the condition that is the basis for the shifting of the static images. The first thing we must do is to add the Script parameters / input parameters. In this example, we want a sensor symbol to change from "white" to "red" when the alarm is active. In this case we need to create a "Double Parameter".

Diagram Tree					Ф ×
🖃 [] Diagram					Börvär
📦 Background Image	PNG - UC-TEST				
🖃 🚔 Objects					
🗉 🚞 ScriptSymbol-Pu	mp-Vänster				
🖃 🔤 ScriptSymbol-Gi	vare-upp				
📦 ScriptSy 👔	View Current Info	rmation)		
📦 State Im 🦉	Search events	Shift+F3			
📦 State Im 🎽	Dicolay in Datails	Ctrl+D			
🕀 🔤 Input Pa 🛄	Osses view	Cuito			
🗉 🚞 Label-ÄV-G 🧮	Open view		•		
🗉 🚞 TextEdit-BV 🔰	Add	Insert	*		Boolean Parameter
🗉 🔛 Home 🔍	Edit	F4			Color Parameter
🗉 🚞 Back 🔣	Grid Edit	Ctrl+G			CustomString Validation Parameter
🗄 🚞 Label-SV1	Remove	Delete			Date Parameter
🗉 🖬 TextEdit-BV 📄	Сору	Ctrl+C	•		Date Time Parameter
🗉 🔛 TextEdit-BV 🖋	Cut	Ctrl+X	•		Double Parameter
🗉 🔤 Börvärden 💼	Paste	Ctrl+V			Duration Parameter
IextEdit-BV	Move		•		ExpressionString Parameter
E Label-G112	Add Comment				Integer (32-bit) Parameter
Label-G	Edit Comments				Integer (64-bit) Parameter
State Im	Export Tabbed AS	СП			List Parameter
State Im 🕞	Export Tabbed A3				Multiple Line Text Parameter
Input Param			,		String Darameter
alle input ratain				-	Time Span Datameter
					Time Span Parameter





Fill in an appropriate name of "Parameter Name" and "Header".

@ @	Properties	- O X
Node Type:		
Double Parameter		
Parameter Templates	9	\odot
General		•
Parameter Name:		
alarmStatus		
Header:		
Alarm Status Givare		

Go back to the "Input Parameters" and create your script:

ŧ	🗎 Label-SV1	😔 I 📀	Properties			23
٠	TextEdit-BV-Mode	Node Type:				
+	TextEdit-BV-Mode_P1 Börvärden	Input Parameters				
٠	🗎 TextEdit-BV-SV1		8~			
	Label-GT12	Parameter Templates	¥			•
	Label-GT12 - text ScriptSymbol-Givare	General				•
	State Image PNG - G State Image PNG - G	On Changed:		ę) 📰	
	State Image PNG PG Sate Image PNG PG Sate Image PNG PG	if (InputParameters	["alarmStatus"] >=1) then (State:=1) else (State:=0)			
	📦 Double Paramete					





What now remains is the "physical" connection to the node. This connection is created by adding a "node field connection". Symbol Property is chosen to the one we created in the "Input Parameters", in this case "Alarm Status Sensor".

0	Properties			ΣZ
Node Type:				
Node Field Connection				
Parameter Templates 🏻 巓				•
General				•
Symbol Property:				
Alarm Status Givare			•	
Node ID:				
SRD_LINK_Gateway_192.1	168.100.207.DUC001.AV01			
		Select reference	•	
Field:				
AlarmStatus			•	



15.1.7 Creating an editable value box

Add a "Text Edit Control"

Diagram Tree			ф ×
🖃 🔣 Diagram			
📦 Backgroun	d Image PNG - UC-TEST		
🗉 🚔 Objec	View Current Information	+	ר
🕀 🛅 Sc 🦉	Search events Shift+F3		
⊞ 🚞 Sc 🐃	Display in Datails - Ctrl+D		-
🕀 🔛 La 🔍	Display III Details Cul+D		
🗉 🚞 Te 🗮	Open view	+	
🗉 🖿 H 資	Add Insert	•	📦 Label
🕀 💼 Ba 🕵	Edit F4		Controls
🕀 🚞 La 🔣	Grid Edit Ctrl+G		Multi Line Text Edit Control
🕀 🚞 Te 🍋	Remove Delete		Text Edit Control
	Copy Ctrl+C	Þ	Images

Enter an ID that will harmonize with the object to be created.

@	Properties	۰	23
Node Type:			
Text Edit Control			
Parameter Templates 🏻 🍟			•
ID General Control			•
ID: TextEdit-Setpoint-GT12			

Enter the width and hight of the text box under the General tab.

<u>@</u> @	Properties		23
Node Type:			
Text Edit Control			
Parameter Templates 🏼 🍟			•
ID General Control			•
Width:			•
65		\$	
Height:		_	
20		\$	





Add a "Node Field Connection"

Select "Value" in Symbol Property and edit the Node ID and Field.

0	New child to TextEdit-Setpo	pint-GT12 🗆 🖻
lew Node Type:		
Node Field Connection		
Parameter Templates	6	
General		
Symbol Property:		Г
Value		•
Node ID:		
SRD_LINK_Gateway_1	92.168.100.207.DUC001.RC01	
		Select reference 💌
Field:		
Setting		

In order to write down to the node, we also need a "Node Control Parameter Connection" as shown below.

	New child to TextEdit-Setpoint-GT12		Ξ Σ
w Node Type:			
ode Control Parameter C	onnection		•
rameter Templates	6		•
General			•
Symbol Property:			-
Value		•	
Node ID:			
Node ID: SRD_LINK_Gateway_1	92.168.100.207.DUC001.RC01		
Node ID: SRD_LINK_Gateway_1	92.168.100.207.DUC001.RC01	reference 💌	
Node ID: SRD_LINK_Gateway_1 Node Control Paramet	92.168.100.207.DUC001.RC01 Select r	reference 💌	





15.1.8 Create a description that is linked to the Diagram

When the users open a diagram via the web interface (or via the app.) he will have a description

symbol up in the left corner by default



When the user clicks on this icon he will get up a customized text that usually describes the function of the specific diagram.

How to create or edit this text is shown below.

- 1. In CMT/ Diagrams, mark the current diagram and select edit.
- 2. Select the General tab and then type or paste your text in the description.

Topology Diagra	ims ×		
Diagrams			
 Diagrams Home 	@ @	Properties	X 0 -
🖽 UC	Node Type:		
🖽 UC2	Custom Diagram		
	Parameter Templates	6	\odot
	ID General		-
	Title:		
	Description:		
	Hi, this is an exampel WEFRwef WEFwefWEFRGRSTHB <swrdegerg ATERHWRY6RT</swrdegerg 	of the description.	
	SRTHWRTH WSRTHY WRTHWRTIJE YTUJETYU SWRTHETYUK RYIKLTUOI JSWRTG SRTHJ SDFAERGAQERG Aergaerg aerg aerg		
	Revert		X Cancel Apply





15.2 How to save Objects to library

- 1. Select the object in the diagram canvas that you want to save as a symbol.
- 2. Open the Library tab and select the folder where you want the symbol to be saved.
- 3. Click "Add Diagram" and select "Add Diagram Containing Selected Objects in Diagram Canvas".




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4. Choose an appropriate name for the symbol and click OK to save.







5. Open the newly created symbol/diagram in Diagram Designer and adjust the width and height so it harmonizes with the symbol.

(This is to more easily place the symbol in the right place when you create diagrams with symbols.)

		test Pump in Library
General		
Add Paste Cut Copy Delete Airange Show Diagra	ound nes m Objects Settings	
Diagram Tree 🛛 🕂 🗙 Design	er Canvas	
🖃 🚺 Diagram		
🗏 🔤 Objects	😳 👔 Egenskaper	
ScriptSymbol-Pump1-Höger	Nodtyp:	
ScriptSymbol-Pump1-Höger - digitalValue	Diagram	
ScriptSymbol-Pump1-Höger - alarmActive	-	
📦 State Image PNG - pump-höger-vit	Parametermallar 📔	\bigcirc
State Image PNG - pump-höger-grön		
State Image PNG - pump-hoger-rod	General	-
Diagram Ponun Window - Mode-Pump1		
	Width:	
	3/	
	Height:	
	37	÷
	Background:	
	Transparent	
	Border Width:	
	No value	÷
	Border Color:	
	L	
	Återställ	OK Avbrvt Använd





15.3 How to Copy/Paste and XML Export/Import of Custom Diagrams and Folders in the Diagrams/Library data sources

15.3.1 Copy/Paste objects in the Diagrams/Library data source from Server 1 to Server 2

- 1. Start a CMT and login to Server 1
 - a. Open the Diagrams/Library data source
 - b. Select the objects that you want to copy, such as some Custom Diagrams or Diagram Folders. In the example below, a number of child objects under the root object are selected.
 - c. Right click and select Copy with the option Copy Objects and Export XML to Clipboard Include Detached Data Content

Library	후 × De	etails Lik	orary								
🖃 🚔 Diagrams		Dis	olay Name	2	Туре		File Name	Name	Title	Upload new custom diagram file	
🗉 🚞 Symbols		🖢 Syn	nbols	Fold	er			Symbols			
Image: Symbols	6	🗎 Nev	v Symbol	s Fold	er			New Symbols			
🖽 Standard		Sta		en view		•	Diagram.xm			false	
_					54						
			Kan Ed	τ	F4						
			💐 Gri	d Edit	Ctrl+G						
			顲 Re	move	Delete						
			Co	ру	Ctrl+C	•	Copy Obje	cts			
			🖋 Cu	t	Ctrl+X	×	Copy Obje	cts and Export XML	to Clip	board	
			🗐 Ad	d Comme	ent		Copy Obje	cts and Export XML	to Clip	board - Include Detached Data Conten	nt
			🕞 Exp	oort Tabb	ed ASCII	\mathbf{F}					
			Exp	oort XML		×					

2. Start a second CMT connected to Server 2

- a. Open the Diagrams/Library data source
- b. In the data source, select the **Parent** object to which the objects will be pasted. In the example here, the root object is selected as the parent.
- c. Right click and select **Paste**.
 - a. Note: Paste corresponds to an Import XML scenario with the import option Create New Objects.
- d. The new objects and all the file content are pasted at Server 2.





15.3.2 Export/Import objects in the Diagrams/Library data source from Server 1 to Server 2

- 1. Start a CMT and login to Server 1,
 - a. Open the Diagrams/Library data source
 - b. Select the objects that you want to copy, such as some Custom Diagrams or Diagram Folders
 - c. Right click and select Export XML To File with the option Export XML of Objects Include Detached Data Content.
 - a. Note: When Detached Data Content is included in the export, it is recommended to use Export XML To File (NOT Export XML To Editor), as the detached data can be very large. This will export the content directly to a file instead of open the XML for the exported data and the file content in the editor.

d.	Save the expo	orted da	ta to a X	ML f	ile.			
Library	ά×	Details Library						
🖃 🚵 Diagrams		Display N	ime Type	e	File Name	Name	1	Title Upload new custom diagram file
🗉 🚞 Symbols		Symbols	Folder		S	Symbols		
🗉 🚞 New Symbo	ols	New Sym	ools Folder		N	New Symb	ols	
🔁 Standard		St O Image: St	it F4 id Edit Ctrl+G move Delete py Ctrl+C t Ctrl+X Id Comment port Tabbed ASCII		Diagram.xml			false
		CI₽ Ex	port XML	• FB	Export XML To File	e 🕨	F	Evport VML of Objects
				C +	Export XML To Edi	itor b	UF CA	Export XML of Objects
Save the exported X	ML file as nagement Client + Export	→ 4	Sök i Export		×			
Ordna 🔻 Ny m	app			8==	• 🕡			
Bibliotek: Do	kument		Ordn	a efter: N	1app 🔻			
Namn	*	S	anast ändrad	Тур				
LibraryExport		20	15-03-18 11:30	XML-d	okument			
Filn <u>a</u> mn:	m LibraryExport2.xml				t T			
Filformat:	XML file				-			
) Dölj mappar	L		<u>S</u> para		Avbryt			

- 2. Start a second CMT connected to Server 2
 - a. Open the Diagrams/Library data source
 - b. In the data source, select the Parent object to which the objects should be imported, e.g. the root object.
 - c. Right click and select Import XML From File with the import option Create New Objects.
 - d. Select the file exported from Server 1, and click Open.
 - e. The new objects and all file content are imported to Server 2.





16 Using new Web Interface

The new web interface is located on port 8080 under the address: *"<IP address-IMC>:8080/KTCImc/"* The username and password are the same as already used for logging in to other Clayster features in the IMC, such as CMT and the older web interface.

\leftrightarrow \rightarrow C (i) localhe	ost:8080/KTCImc/
KTC	
	Inloggning IMC
	Användarnamn
	Lösenord

16.1 Information Page

The first page on which you end up after a successful login is the information page. Here you will find information about the current version, licenses used to include max limit, MAC address and IP information. The information page is also available from the menu selection at the top of the Information button.

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← → C ① localhos	t:8080/KTCImc/information			아 ☆ 🚺 월	000
KTC			Logga ut		Inställningar -
Þ	IMC Information Version: Licens: Macadress: IP Information:	*3.10.1* MeteringTopology SrdLinkNode = 9 (50) ModbusInputRegister = 12 (5000) ModbusHoldingRegister = 3 (50 (5000) *02:00:4C:4F:4F:50* Ip-Address 169:254:93:26 Netmask 255:255:0.0 Default Gateway 192:168:0.1 DHCP aktiv True DNS Server 1 0.0.0 DNS Server 2 0.0.0	00) ModbusCoilf	Register = 2	
					8 2019 KTC Control AB

16.2 Navigation Menu

Under the navigation menu you can log out, access the information page and a menu with settings.

Logga ut	Information		Inställningar -
		IMC Ip-I Lice Tide MC Bac Fat	-inställningar nställningar enshantering sinställningar -funktioner ckup-funktioner priksåterställning rta om IMC

16.3 IP settings

Under this page, the IP settings can be changed for the network adapter. It is possible to change IP address, subnet mask, default gateway and DNS-servers.

After saving new IP settings, there will be a delay of 25 seconds before the new settings are implemented. If the settings have been saved by mistake or if incorrect data has been saved, it is possible to undo this within the time interval, by clicking Undo Settings.



	Sonvor
	Server
PAdress	
92.168.102.132	
letmask	
255.255.255.0	
Default Gatew	/ay
92.168.102.1	
ONS Server 1	
92.168.102.1	
ONS Server 2	
0.0.0.0	

16.4 License

Under license, existing license can be replaced. Click Select File, locate your new license file on your computer and select Load. After the new license file has been loaded, the IMC will restart.

6	
	För att ersätta licensen som körs i IMC:n, välj en ny licens och klicka på "Ladda".
	Obs: Installation av ny licens kommer innebära att IMC-programvaran startas om.
	Välj fil Ingen fil har valts
	LADDA

16.5 Time Settings

During time settings, time and date can be changed. It is also possible to see the current ntp server against which the IMC is synchronized, as well as the current time and the current server's time.





16.6 Backup functions

During the menu selection backup functions, it is possible to create new backups, download backups, restore from a backup and delete existing backups. Select the backup to be downloaded, restored or deleted and click on the button for the desired function

There is also an option to upload your own backups to the IMC. Click Select File and select a file backup file from your computer that you want to upload, then click Upload Backup.



2



Backuper på enheten	
2018-03-28 14-20 cbk	
2018-06-29 15-17 imc test.cbk	
2019-03-12 11-11.cbk	
2019-09-09 13-02 cbk	
2019-09-09 13-24 cbk	
2019-09-12 10-12 cbk	
2019-09-12 14-09.cbk	
2019-09-17 11-04.cbk	
Backup_20190705_0855.cbk	
Backup_20190816_0943.cbk	
Backup_20190816_1010.cbk	
Skapa ny backup Ladda ner backup Återskapa vald backup Radera vald backup	
Ladda upp egen backup till IMC	
Välj fill Ingen fil har valts	
Ladda upp backup	

16.7 Factory Reset

This feature is used to perform a complete factory reset of the entire system. Database, all configurations, charts, etc. will be deleted and all settings will be restored to the original. The only thing that will be saved is the license file, so make sure all settings, charts, etc. have been backed up before a factory reset is done.

-abriksåterstäl Denna funktion använ kräver administratörsrä	Ining av IMC Is för att fabriksåterställa IMC:n. Enheten kommer efter återställningen att startas upp igen automatiskt med fabriksinställning. Åtgärder ttigheter.
Observera att samtli licensfil.	gdata, alla inställningar, konfigurationer och alla databaser kommer att raderas från enheten. Det enda som sparas är enhetens
Påbörja fabrikså	terställning av IMC
ок	

16.8 Restart IMC

This function is used to restart the system. The options that can be selected are, Restart IMC service, which restarts the IMC software itself. The other option is Full System Restart, which restarts the entire system, including the hardware.

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16.9 Create Exports for Skanska Energy Box and Energy Portal

To create exports, navigate to Konfiguration -> Skapa exporter

Logga ut	Information	Konfiguration -	Inställningar 🔻
		IMC-Exporter	
		Skapa exporter	
			5

This will show a page where you can choose if you want to create and export for Skanska Energy Box (SEB) or Energi Portalen.

Before you create export, a sender mail should have been configured in the IMC, using CMT -> Settings -> SMTP -> From. This address will be used in the template created.

16.9.1 Erase Exports

The IMC can hold two exports, one of type SEB and one for Energi Portalen.

If there is any previous configuration, they will be shown under "Befintliga export-konfigurationer på IMC:n" They can be marked an deleted by clicking "Radera Export".







16.9.2 Create new exports

To create a new export, choose the type you want and fill in export information such as project name etc. No white spaces, trailing spaces or special character (except dash and underscore) allowed in project name and number.

s Skapa ny export
● Skapa export för Skanska Energy Box (SEB)
◯ Skapa export för Energiportal
Projektnamn:
Projnamn
Projektnummer:
1234
E-postmottagare för export:
rob@ktc.se
SKAPA EXPORT
Lyckades! Exporten har sparats på IMC:n.

Then to create the export, click on "Skapa Export" If success, the green bar will be lit. If it already exists an export of chosen type, following message will appear.



If the export can't be created due to communication error or similar, this field will show.

