# IDT CATALYST EDGE GATEWAY





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#### PRELIMINARY NOTES

The following document illustrates the Edge Manager application's IoT Catalyst Gateway device configuration procedure.







#### IOT CATALYST EDGE GATEWAY CONFIGURATION

Before powering up the system, be sure to:

- have read the datasheet and viewed the schematics
- have inserted the SIM in the gateway and connected all the peripherals of the kit.

When the IoT Catalyst Edge Gateway starts, it activates a hot spot WiFi for management activities. For security reason, if nobody joins the local WiFi network, the hot spot is activated in 5 minutes.

To configure the IoT Catalyst Edge Gateway, connect to it via WiFi using a smartphone, tablet, or PC.

To connect to the IoT Catalyst Edge's hot spot:

- Go to the Wi-Fi configuration section of the device (smartphone, tablet, laptops, etc.)
- Search for the network with an SSID equal to the MAC address of the gateway (MAC address is printed on the label on the back of the IoT Edge Gateway)

The credentials to connect via Wi-Fi with the gateway are:

Wi-Fi password: fwdedgext001

The gateway configuration through Edge Manager is done using a browser and opening the page that appears at the following address:

IoT Edge Gateway URL: http://172.24.1.1:9090/

The IoT Catalyst Edge Manager login page will come, where you will be able to log in with the following credentials:

#### User: catalyst Password: Fwd0012k18

Alternatively, you can access IoT Catalyst Edge Manager via a wired network, as follows:

- Connect the pc to the gateway using a LAN cable and set the network card of your pc to the same subnet as the gateway.
- The address set on the gateway's LAN1 port is default 192.168.1.199.
  - Access via the following URL: http://192.168.1.199:9090/

If the address of the IoT Catalyst Edge Manager is different, you need to change the URL above, replacing the default address with the actual IP address, as follows:

http:// gateway\_ip\_address: 9090 /

Once authenticated on the web app, the following page will appear:





09:04 14/2/2022
General Info
Hypervisor Name
Endpoint
Updater Version
2.2 build 001
Operating System
Linux 5.4.81-v7+
Serial Number

# LOCAL TEST OF SIGNALS

This section describes how to test the I / O using the Edge Manager application

## DIGITAL SIGNALS

• Click on GPIO Digital menu item to test digital signals.

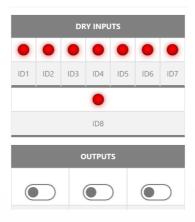
General * Configuration * Test Connections *
MODBUS
GPIO Digital
GPIO Analog







#### **Digital GPIO Test**



By changing the status of the input signals, you will have to see the LED turn green, while by changing the status of the output signal, you will have to check the effect of the status change in the field (it depends on what you have connected to the output signal you are testing).





## ANALOG SIGNALS

General *	
Configuration -	
Test Connections -	
MODBUS GPIO Digital GPIO Analog	
09:27 21/3/2022	=

## Analog GPIO Test

INPUTS			
0.01	0.01	0.01	0.01
Al1	AI2	AI3	Al4
OUTPUTS			

By modifying the state of the collected input signals from connected external sensors/probes, the corresponding values of the analog inputs must vary.





#### MODBUS

This section shows how to perform a Modbus test through the appropriate area of the Edge Manager.

• Open the Test Connections menu and select MODBUS.



 Choose the Modbus protocol of the device you want to test; unless otherwise indicated, select RTU.

MODBUS Configuration RTU	
RTU TCP	

The following example shows how to read the temperature value from a Modbus RS485 temperature/humidity probe.

The Modbus port of the gateway is / dev / ttyRS485 The parameters of the temperature probe used in the example are as follows:

- Probe Modbus configuration (default)
  - Slave Address: 1
  - o Baudrate: 9600
  - Bytesize: 8
  - Parity: NONE
  - Stopbits: 1

Modbus register to be interrogated to read the temperature value

- Byteorder: BIG
- Wordorder: BIG
- Type: Analog Input
- o Register: 1
- Datatype: Integer





- o Divider: 0
- Number of Registers: 1
- Signed: True

	Parity		
Edge Computer Manager	NONE	test measure	
16:14 14/10/2022	Stopbits	Set Measure Value	
	1	Insert set measure value	
MODBUS Configuration	Timeout	Register	
RTU	5	1	
	Slave Address	DataType	
RTU TCP	1	Integer 🗸	
	Byteorder	Divider	
Port /dev/ttyRS485	BIG	0	
Baudrate	Wordorder	Number Of Registers	
9600	BIG	1	
Bytesize	Туре	Signed	
8 v	Analog input 🗸	True	
Parity	Measure Name	Test Modbus GET Test Modbus SET	
NONE	test measure		

Once inserted the parameters in the respective fields, click the "Test Modbus GET" button. If the connection and communication have been established correctly, you will have a response like the following:

Wedsure Indine	
Test RTU modbus: success. test measure: 310.0	×
Integer	~
Divider	
0	~
Number Of Registers	
1	
Signed	
True	~
Test Modbus GET Test Modbus SET	

(Temperature is expressed here in tenth of a degree)





#### IOT CATALYST EDGE CONFIGURATION

The configuration operations to be carried out are the following in order of execution.

APN CONFIGURATION

#### Click on WAN

General + Configuration +
IoT Catalyst
Time
LAN
WAN
VPN
Shell
EMS
Zabbix
Board
Factory Reset
Test Connections 🔻

The following page will appear with the WAN 1 and WAN 2 settings.

Move to the WAN 1 box. In the APN field, enter the APN of the sim used, then click on the Save and Connect button.

Edge Compute	r Manager	Insert MCC
16:11 14/10/2022		MNC
		Insert MNC
		Username
WAN 1 Con	figuration	Insert Username
		Password
Download limit	Upload limit	Insert Password
1024	1024	Auth Type
APN		DEFAULT
Insert APN		
MCC		
Insert MCC		DEFAULT
MNC		APN Protocol
Insert MNC		DEFAULT
		Save and Connect
Username		
Insert Username		

Go to General Services and check that the WAN is active.

Wait a few seconds. If successful, the relative status will have a green dot and the signal





strength indicated.

Please note that sometimes, the signal may not be read, but the system still shows the green dot indicating the connection. To view the actual status of the signal, try reloading the page

Edge Computer Manager		
General 🔻	Running Services	
General		
System Info		
Time	Services	Status
Network	Updater	•
Services		-
Zabbix	VPN	
Edge Manager Log	NTP	•
System Log		-
Configuration -	WAN -71 dBm	
Test Connections *	IoT Catalyst Hypervisor	0
10:25 21/3/2022	EMS	•
	Zabbix Proxy	•
WAN 1 Configuration	Zabbix Agent	•
3		
Decodered linear trade differen		

The WAN's led must remain steady green; otherwise, please get in touch with the supplier's technical support service.

Before activating the WAN, local time could not be in synch (warning triangle next to the time in the navbar); time will align by itself when the connection is active and the NTP service is activated (NTP is active by default).

In this case, you will have to log in again. Just refresh the page to check if you need to log in again.

A triangle next to the time in the navbar, if present, indicates a misalignment between the time of the web client and the gateway.

The gateway time is in UTC, the time of the device used for configuration is usually in UTC + 1 during the solar time period and UTC + 2 during the summertime period.





• Click on LAN.

General -	Edge Computer Manager
Configuration -	
loT Catalyst Time LAN	LAN 1 Configuration
WAN VPN	IP Address  192.168.1.184  Ping
Shell EMS Zabbix	Subnet 255.255.255.0 - /24 🗸
Board Factory Reset	Gateway Insert gateway Ping
Test Connections -	Save
LaT Catalust	
IoT Catalyst	

- Fill in the IP Address field of the relevant interface with the IP chosen for the IoT Catalyst Edge Gateway
- Leave the Gateway field blank.
- Once edited all the fields, press the **Save** button.





#### NTP CONFIGURATION

The NTP service is active by factory default. Check from the services page that it is active. If it is not happening, open the NTP configuration tab

General • Configuration •	09:40 14/2/2022
IoT Catalyst Time LAN	NTP Configuration
WAN VPN Shell EMS Zabbix	Enabled NTP Server O.centos.pool.ntp.org 1.centos.pool.ntp.org 2.ce
Board Factory Reset Test Connections *	Save
13:47 21/3/2022	
Command Shell	

In the NTP Server field, check the server list entered.

The default list is:

0.centos.pool.ntp.org 1.centos.pool.ntp.org 2.centos.pool.ntp.org 3.centos.pool.ntp.org

In the top navigation bar, there is a datetime, which indicates the system clock. In case of misalignment between the device used to browse the Edge Manager and the IoT Catalyst Edge Gateway, an alarm signal will be displayed that warns the user to set the time or to enable the NTP synchronization service.

You can check that the time is synchronized from the Running Services section.





# **Running Services**

Services		Status
Updater		•
VPN		•
NTP		•
WAN -	71 dBm	•
IoT Catalyst Hypervi	sor	•
EMS		•
Zabbix Proxy		•
Zabbix Agent		•





#### VPN CONFIGURATION (OPTIONAL)

If you want to install a VPN certificate on the Gateway proceed as follows.

Upload a certificate file: it is possible to upload a certificate file \* .ovpn and save it on the system using Save. To upload the certificate, use the Browse button to go to the folder of the device (smartphone, tablet, PC) you are using, locate the desired certificate file and select it.

07:54 17/2/2022		Are you sure to save this OpenVPN certificate?	×	VPN Certificate uploaded correctly.	×
OpenVPN Configura	ition	Ok Cancel OpenVPN Configura	ation		
Choose OpenVPN certificate	Browse	edgext_test2_103.ovpn	Browse	- allowing the second	
Save		Save		Save	

This feature also behaves like the WAN, so it will always take up to five minutes for the service to go live.

To confirm the success of the operation, please check the Running Services section.

Running Services

Services	Status
Updater	•
VPN	•
NTP	•
WAN -71 dBm	•
IoT Catalyst Hypervisor	•
EMS	•
Zabbix Proxy	•
Zabbix Agent	•





#### **CREATION OF AN IOT CATALYST HYPERVISOR**

The IoT Catalyst Edge Gateway is factory ready to connect to an active instance of IoT Catalyst Studio. The connection is possible after the successful onboarding of the IoT Catalyst Edge Gateway.

IoT Catalyst is a Low Code/No Code IoT Edge Platform that offers IoT DevOps and IoT Device Management tools to make the IoT simpler, faster and cheaper than it has ever been!. As an IoT Edge Platform, all the business logic is pushed at the edge, and it is managed by a single control plane that works in any web browser: the IoT Catalyst Studio. (https://www.iotcatalyst.com)

To perform the onboarding:

OT CATALYST

Click on IoT Catalyst

	Edge Computer Manager	
	General 👻 Configuration 👻	
	loT Catalyst	
	Time	
	LAN	2
	WAN	
	VPN	
	Shell	
	EMS	
	Zabbix	
	Board	
	Factory Reset	
	Test Connections -	
	12:25 21/3/2022	
The following page will appear.	General Info	
	IoT Catalyst	
	In order to create a new Hypervisor, please generate a token	
	loT Catalyst Studio Endpoint	
	https://  Insert Endpoint Ping	
	User Password	
	Insert User Insert Pass Generate	and the second se
	Hypervisor Name	
	Insert Hypervisor Name	
	Hypervisor Description	
	Insert Hypervisor Description	
	Location Host Type	



Now, you can create and install an IoT Catalyst Hypervisor on the gateway. This operation requires the request of a valid token issued by an IoT Catalyst Studio instance.

To create the token:

- Select: https://
- Enter as endpoint: <address of the Catalyst study>
- User: <token creation user>
- Password: <token creation user password>

Then click on Generate and wait for the operation to complete

Please waitgetting Token.			Success. Token generated corr Locations and Host Ty correctly.	5	×
Insert Hypervisor Name					
Hypervisor Description			Insert Hypervisor Name		
Insert Hypervisor Descr	iption	Ну	Hypervisor Description		
Location	Host Type	I	Insert Hypervisor Description		
		Lo	cation	Host Type	
				Edge X1 (p35-l	ir 🖌
Create and Install					
			Create and Install		

Once a valid token is received, it is possible to create an IoT Catalyst Hypervisor.

IoT Catalyst S		pint	_		
https:// 🗸	· x.x.x.x		Ping		
User	Passwo	ord			
XXXXXX	•••••	•••	Generate		
Hypervisor Na	me				
TEST_1					
Hypervisor De	scription				
description					
Location		Host Typ	be		
IoT Catalyst	Defaul	Edge	XT (p37-lir	~	
Create and I	nstall				
Delete					





• Click the **Create and Install** button and wait for the installation to complete.

**Important notice**: check that energy saving of the device (PC or smartphone) is disabled to avoid turning off the monitor and the consequent disconnection from the gateway. The disconnection would cause the loss of information on the progress of the installation.

JoT Catalyst Studio Endpoint		
Are you sure to create and install X TEST_1 Hypervisor?	Please wait, do not close this page. Execute install script	Success. X Hypervisor KitLab installed correctly.
OkCancel		
Hypervisor Name		
TEST_1		
Hypervisor Description		
description	Uninstall	Uninstall
Location Host Type		
IoT Catalyst Defaul Edge XT (p37-lir 🗸		
	Available Hypervisors	Available Hypervisors
	KitLab	✓ Load
Create and Install	Install	Install
Delete		
Uninstall		





#### PTC THINGWORX EMS CONFIGURATION

IoT Catalyst Edge Gateway can communicate natively with the edge service of PTC ThingWorx - The Edge Micro Server (from now on EMS). Some of the features described in this paragraph require an appropriate preliminary configuration of the PTC ThingWorx instance, as installing specific components to release keys and certificates is necessary.

The related service can be enabled and set via the EMS form if the above is satisfied.

To configure the EMS, you need to navigate -> Configuration -> EMS

General -	
Configuration -	
IoT Catalyst	
Time	
LAN	
WAN	
VPN	
Shell	
EMS	
Zabbix	
Board	
Factory Reset	
Test Connections -	
13:47 21/3/2022	

Command Shell

Configure the service as follows.

IOT CATALYST Edge Gateway

- Enable Offline Message Store (the flag will turn green) (default is enabled)
- Enter the values in the WS Server Address and Port fields and leave the others with the default values.

Setting	Value
WS Server Address	<ip ems="" server=""></ip>
Port	<ems port="" server=""></ems>
Buffer directory	/home/catalyst/IoTCatalystOS/configure/config_files/ems/offline
Max Buffer Size	10000000
EMS Log Folder	/home/catalyst/IoTCatalystOS/configure/config_files/ems/logs/
HTTP Server IP Address	127.0.0.1



	10000000	
13:45 17/2/2022	EMS Log Folder	
	/home/catalyst/IoTCata	lystOS/configure/cor
EMC Configuration	WS Server Address	Port
EMS Configuration	X.X.X.X	123
	HTTP Server IP Address	
Offline Message Store	127.0.0.1	
	Hypervisor Name	
Buffer directory /home/catalyst/IoTCatalystOS/configure/config	KitLab	
	АррКеу	
Max Buffer Size (Bytes)	Insert KEY	
10000000	Get AppKey and Save	
EMS Log Folder		
/home/catalyst/IoTCatalystOS/configure/config_		
WS Server Address Port		

Click on Get AppKey and Save





# APPENDIX

# Modbus RTU RS485 parameters

Setting	Value
Baud rate	<ip ems="" server=""></ip>
Byte size	<ems port="" server=""></ems>
Parity	/home/catalyst/IoTCatalystOS/configure/config_files/ems/offline
Stop bits	10000000





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