Multitel

ALPHA CORDEX CXC HP

APPLICATION NOTE

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PURPOSE: This application note presents a step-by-step approach to integrate an intelligent DC Power Plant controller to a FUSION and an iO Gateway.

Target Equipment: Alpha Cordex CXC HP System Controller

Equipment Description: The Codex CXC HP is an intelligent DC Power Plant controller manufactured by Alpha Technologies. The controller provides a mean to communicate via SNMP or Modbus TCP

PRODUCT DESCRIPTION	
Name	Cordex CXC HP
Manufacturer	Alpha Technologies
System Type	System Controller
Modbus Version	
Manufacture Technical Support	**1-800-863-3364**
Specificities	CXC HP ADIO for shunt monitoring

Alpha Cordex Communication Settings

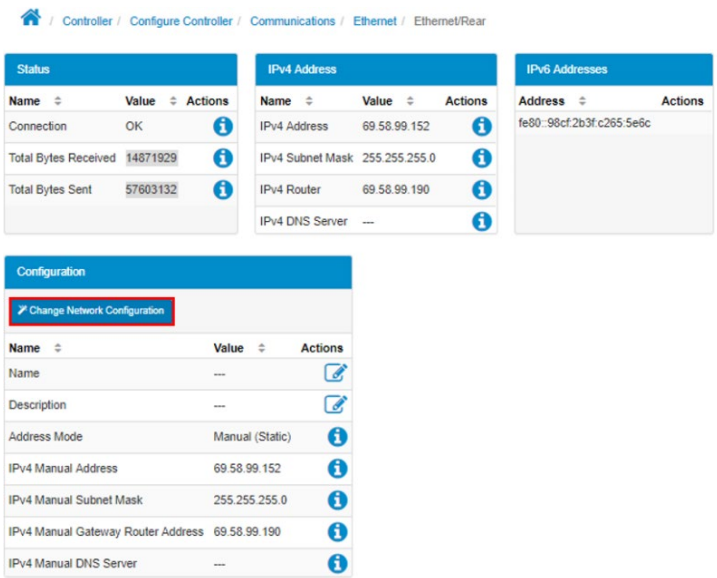
1. Connect to the controller with a laptop using an Ethernet cable
    a. From the LCD main dashboard click <Shortcut>, then press <Ethernet>

b. Check the front Ethernet port is configured to use static IP address (Default = 10.10.10.201)
c. Configure your laptop Ethernet port to use a static IP address that is on the same network of the Cordex CXC HP controller front port (ex. 10.10.10.1).
d. Connect your laptop on the Cordex CXC HP front port, open a web browser and type the Cordex CXC HP IP address in the address bar

2. Navigate to **Controller/Configure Controller/Communicate/Ethernet/EthernetRear** if the network cable is connected to the back of the CXC HP.

   Navigate to **Controller/ConfigureController/Communicate/Ethernet/EthernetFront** if the network cable is connected to the front of the CXC HP.

   Click on the **Change Network Configuration** wizard.



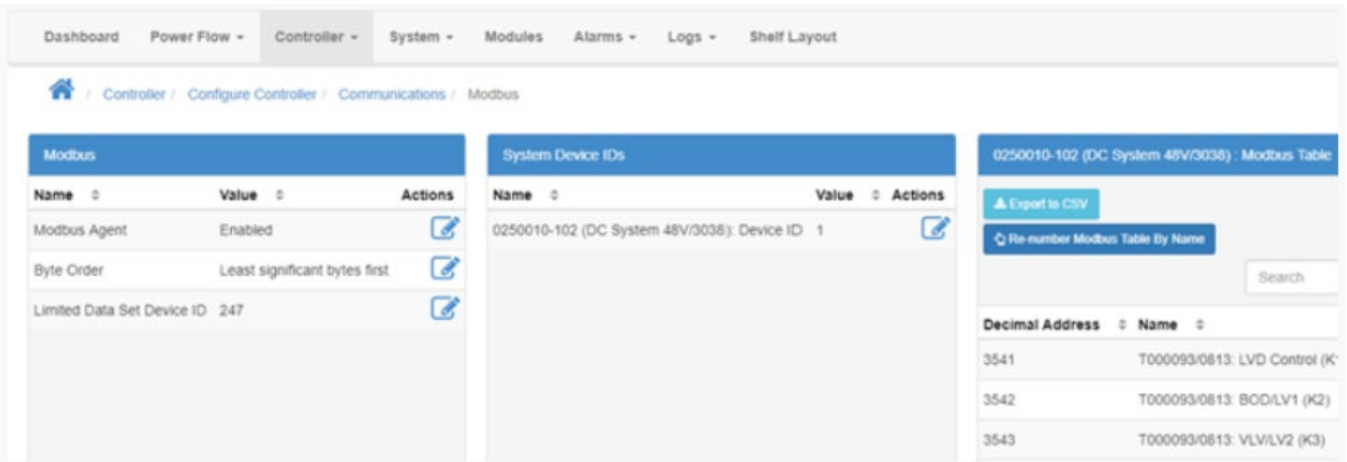
3. Ensure that the **IP Address Mode** is set to **Static.**
   The **IPv4 Manual Address** will be set to the IP address assigned to the controller for the network. 192.168.1.1 (Must be different from 192.168.1.2 (IO gateway front port default address)

The **IP Subnet Mask** will be the Subnet Mask assigned to the controller for the network. 255.255.255.0 [1]

4. Ensure MODBUS is enabled, and the device ID is set to the value desired by the customer.

    1. Following the Controller menu link as shown and set the Modbus Agent to Enabled if it is not already done (Controller / Configure Controller / Communications / Modbus).

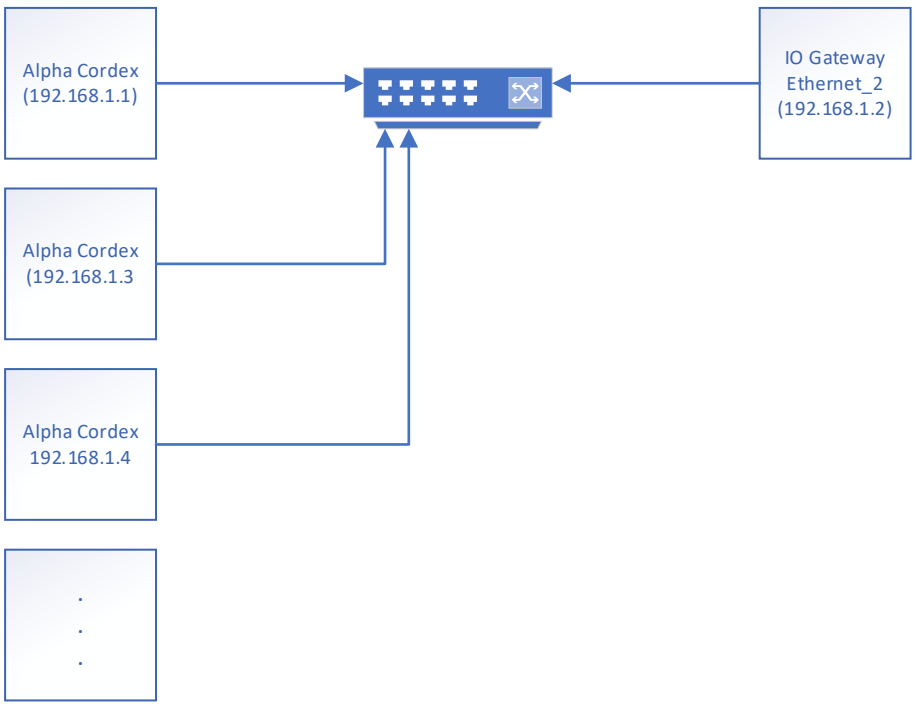
    2. The System Device ID for the DC System can be left to the default value (Device ID 1).
        a. This ID can be the same across all Cordex CXC Controller



5. Export Modbus Table to CSV and send it to Multitel. This document will be used to complete the Fusion configuration.

[1] CXC HP Stride Converter Setup Guide.docx

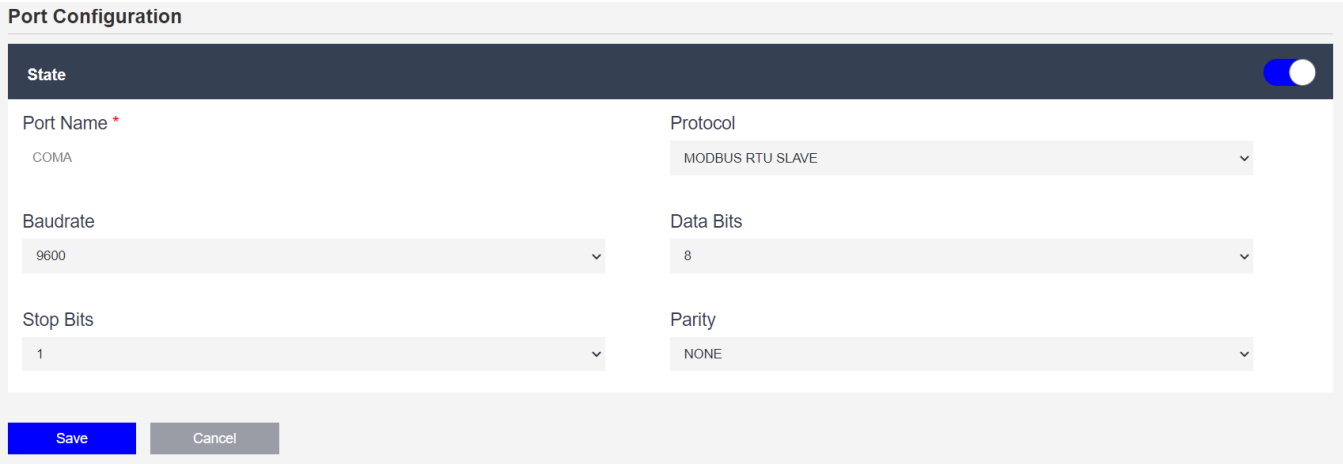
ALPHA CORDEX CONNECTIONS



IO GATEWAY COMMUNICATION SETTINGS

1. Connect to the IO Gateway with a laptop using an Ethernet cable
    a. Ethernet_2 default IP address is 192.168.1.2
    b. Connect your laptop on the IO Gateway front port, open a web browser and type the gateway IP address in the address bar
2. Navigate to **Settings/Connections/RS-485 COM A**
    a. Set RS-485 – COM A need to be Enable
    b. Set Baudrate to 9600
    c. Set Stop bits to 1
    d. Set Protocol to Modbus RTU Slave
    e. Set Data bits to 8

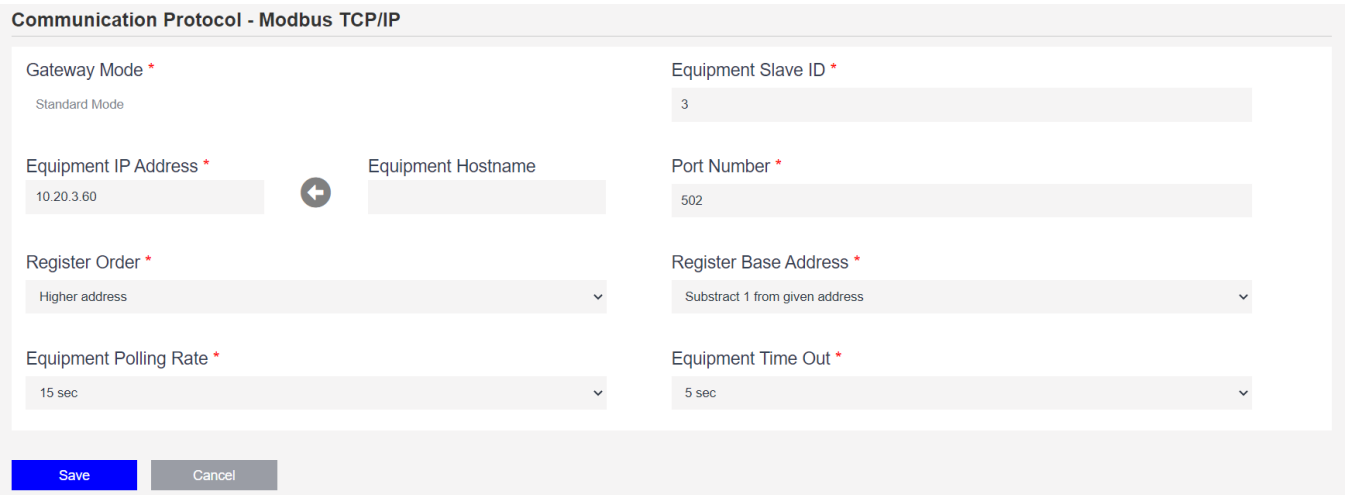
f. Set Parity to None



3. Navigate to **Settings/Protocols /Modbus Slave**
   a. Set State to Enable
   b. Use a Slave ID that is not currently used by another Modbus device

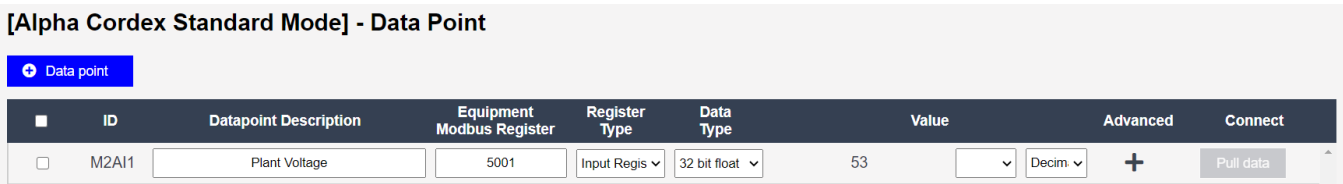
4. Navigate to ***Data Sources (Create a Standard Equipment to Validate TCP communication)***
   a. Click on + Equipment
   b. Add an Equipment name (DC plant identification)
   c. Set Equipment Category to DC Plant
   d. Set Equipment Model to Cordex CXC HP
   e. Set Communication Protocol to Modbus TCP/IP Client
   f. Set Gateway Mode to Standard Mode

g. Set Equipment Slave ID to the Cordex System device ID (Device ID = 1) (Alpha Cordex communication setting section 4)
h. Set Equipment IP Address to the Alpha Cordex IP address
i. Set port Number to 502
j. Set Register Order to Higher address
k. Set Register Base Address to Subtract 1 from given address
l. Set Equipment Polling Rate to 15 sec
m. Set Equipment Time Out to 5 sec
n. Save Equipment

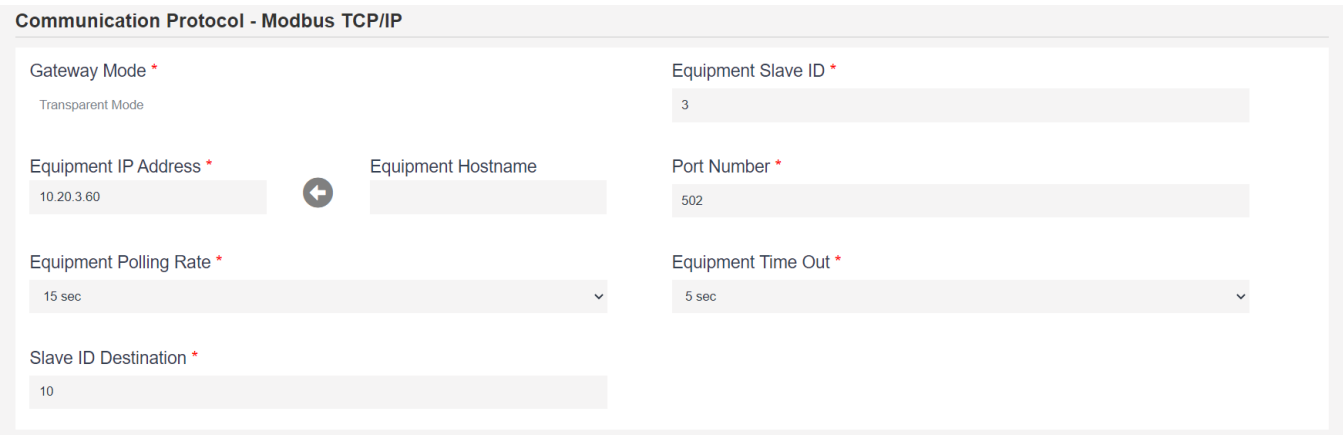


5. Navigate to ***Data Sources/Action/…/Data Points***
   a. Click on + Data point
   b. Set Datapoint Description to Voltage
   c. Set Equipment Modbus Register to 5001
   d. Set Register type to Input Register
   e. Set Data Type to 32-bit float
   f. Set Unit to V
   g. Click on Pull Data
   h. Click on Back

i. The DC plant voltage should appear under the Value Column
j. Proceed to the next step if successful



6. Navigate to **Data Sources (Create a Transparent Equipment to Validate Modbus RTU communication)**
   a. Repeat step 4.a to 4.e
   b. Set Gateway Mode to Transparent Mode
   c. Repeat step 4.g to 4.m
   d. Set Slave ID destination to an unused Modbus RTU slave ID
   e. Save Equipment



FUSION CONNECTIONS

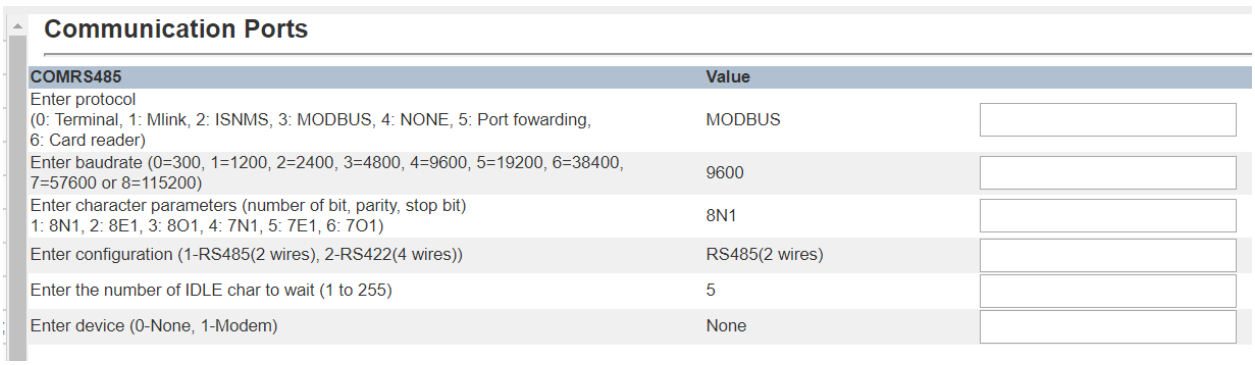
Refer to your detailed engineering or the layout of your MODBUS network, respect the MODBUS best practices at all times by preventing star shape network, thus terminating to the last equipment of the current MODBUS daisy chain trunk or if this is you first equipment on the network device, then terminate directly at the FUSION back panel. The FUSION offers (2) RS-485 ports, one called MLINK and the other one RS-485. Use the connector available from Multitel to convert the RJ-12 connector to a screw type connector. (Part# is C-7000-MOD).

If no other Modbus device are connected to the Fusion

1. Connect Fusion MLINK or RS485 + (C-7000-MOD) to IO Gateway RS-485 COM A Rx/Tx +
2. Connect Fusion MLINK or RS485 – (C-7000-MOD) to IO Gateway RS-485 COM A Rx/Tx –

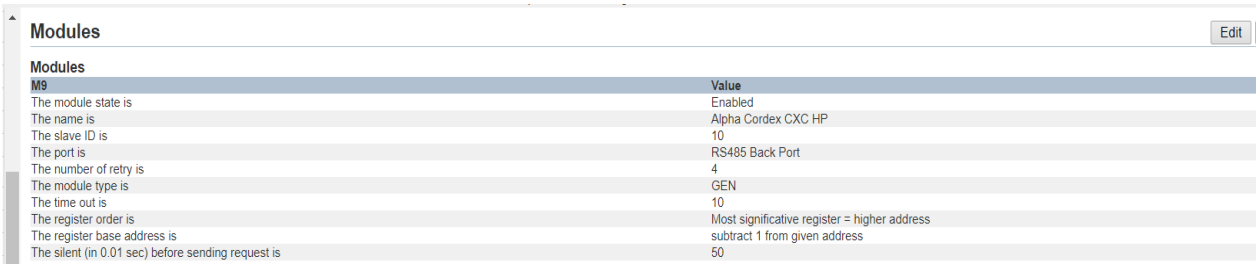
FUSION COMMUNICATION SETTINGS

Once you have logged into the FUSION using the “supervisor” username and no password, click on **CONFIG** menu and select “**Communication Ports**” from the left menu. Select the **MLINK** or **RS-485** port and config operating parameters as follow:



FUSION "MODULE" SETTINGS

Once the FUSION communication port is setup, associate the equipment to a specific Module number. Select "**Modules**" from the left menu and choose the pre-assigned module or click on a module available (State = None).



Modules

Edit

Modules

M9	Value
The module state is	Enabled
The name is	Alpha Cordex CXC HP
The slave ID is	10
The port is	RS485 Back Port
The number of retry is	4
The module type is	GEN
The time out is	10
The register order is	Most significative register = higher address
The register base address is	subtract 1 from given address
The silent (in 0.01 sec) before sending request is	50

*Configure the name of the Module using the reference name of the DC Plant, such as "**Transport #1**"*

FUSION "TEST CHANNEL" SETTINGS

Once the Equipment is associated to a module, a list of channels will appear and be available for Multitel to configure. However, in order to test the MODBUS RTU wiring and Alpha controller communication settings, it is highly recommended to configure a test channel as per the following to validate. Click on M1A1 and configure the operating parameters as follows:

M9A1	Value
The channel state is	Enabled
The name is	Plant Voltage
The measure unit is	V
The number of decimal digits is (4 = auto)	2
The bits for the mask used to extract value is	None
The strings associated to each code is	Not Programmed
The register address is	5001
The reading function code is	4
The sign is	Normal
The data type is	32-Bit Floating Point Number
The multiplication factor is	1
The channel offset is	0