Multitel

LIEBERT INTELLISLOT UNITY CARD
(THERMAL MANGEMENT)
APPLICATION NOTE

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Document Name:	Liebert CRAC unit_Intellislot Unity Card_Application Note_2020-11
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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.

Target Equipment: Liebert Thermal Management Equipment with IntelliSlot Unity Communation Card

Equipment Description: IntelliSlot Communication Card give the possibility to monitor a wide variety of Liebert Thermal Management Equipment. The communication card provides a mean to communicate via standard 2-wire RS-485 using Modbus RTU protocol.

PRODUCT DESCRIPTION	
Name	Intellislot Unity Card
Manufacturer	Liebert
System Type	Thermal Management equipment
Modbus Version	
Manufacture Technical Support	**1(800)543-2378**
Specificities	Required Communication Card to be installed on the Unit. (IS-Unity-DP Card) Product Model and Product Controller information need to be sent to Multitel (Ex. Liebert Challenger 3000 w/ Liebert iCOM v4)
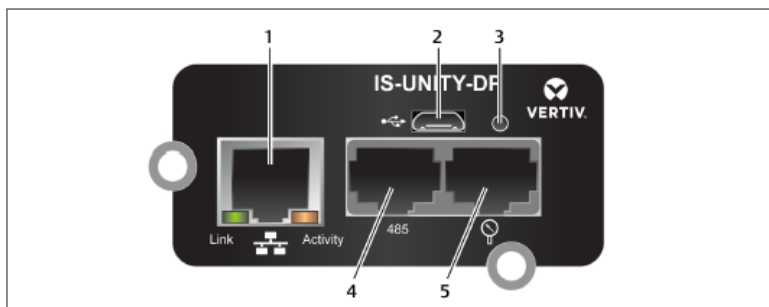
ITEM	DESCRIPTION
1	RJ-45 Ethernet port
2	Micro-USB port
3	Reset button, see Manually Resetting to Factory Defaults on page 67.
4	RS-485 port (BACnet/MSTP, Modbus RTU or YDN23. Only one may be used.)
5	Liebert sensor-network port (SN sensors only)

EQUIPMENT CONNECTIONS

MODBUS RTU over RS-485 must be wired in a daisy chain pattern, star network is not allowed as it modifies drastically the electrical characteristics of the RS-485 driver and can ultimately cause communication failures.   The use of a good quality cable such as a 22AWG stranded, twisted shielded wire to perform the termination at the generator controller.   Polarity must be respected throughout the RS-485 network, otherwise communication failures will prevail.

Each Unity cards should come with an Adapter RJ-45 to 2 position Terminal Block.

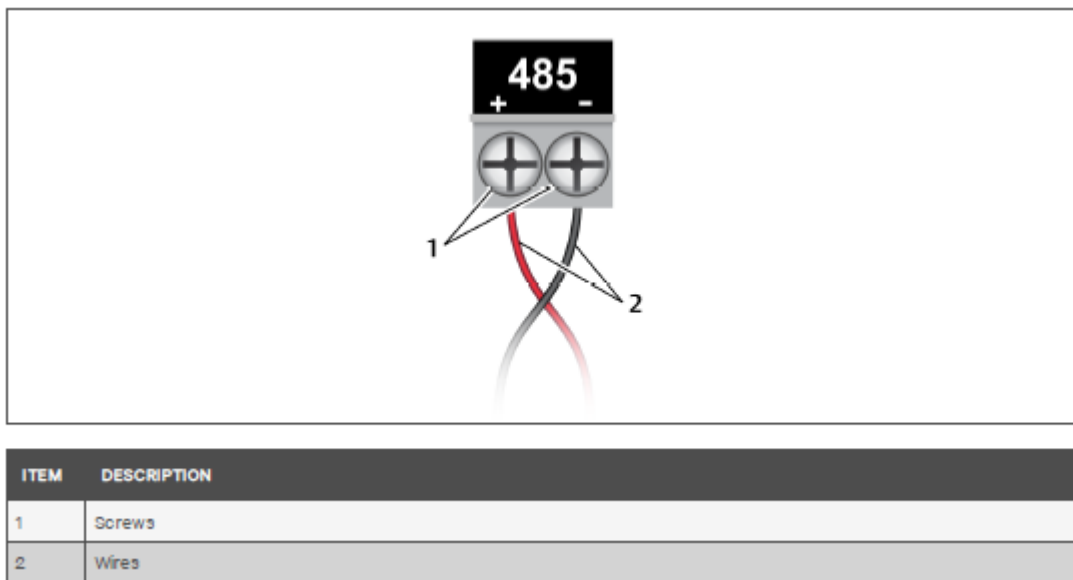| ITEM	DESCRIPTION
1	Screws
2	Wires

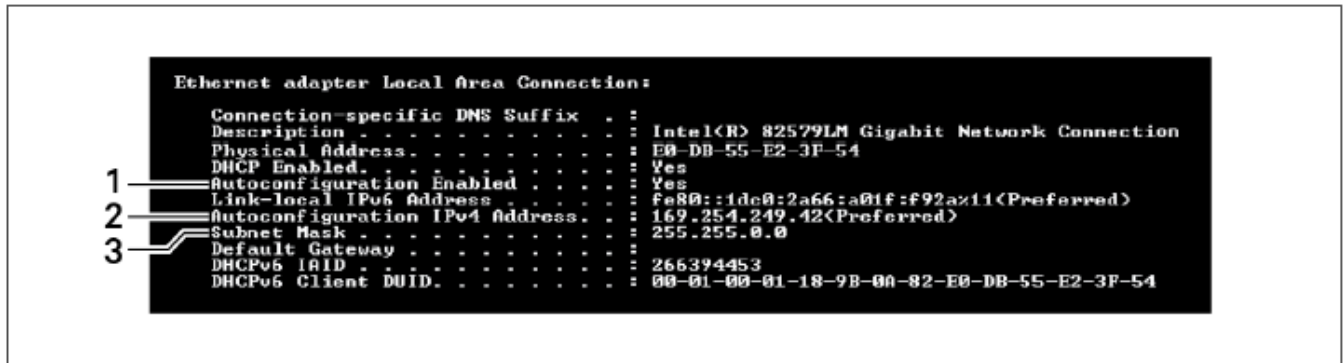Figure 1 Liebert Intellislot Unity Card Installer/User Guide page 6

Position the adapter so the side with the positive and negative symbol is face up. Plug the connector in the unity card RS485 port.

EQUIPMENT COMMUNICATION SETTINGS

Here is the list of general parameters to be implemented in each equipment

- Node Address: 1-247, An address cannot be used more than once on the same network
- Baud rate: 9600 bps
- Parity: None

- Stop Bits: 1

1. Connect a computer (Windows XP or later) to the card RJ-45 ethernet port.
2. Use window command prompt to verify the computers' IP address settings.
    a. Press Windows key + R, and enter cmd, and click OK
    b. Type ipconfig /all and press Enter, then verify the following:
        i. Autoconfiguration Enabled = Yes
        ii. Autoconfiguration IPv4 address = 169.254.x.x
        iii. Subnet Mask = 255.255.0.0

ITEM	DESCRIPTION
1	Autoconfiguration Enabled
2	Autoconfiguration IPv4 Address
3	Subnet Mask

Figure 2 Liebert Intellislot Unity Card Installer/User Guide page 5

3. Open a web browser session and enter 169.254.24.7 to connect to the card's web interface.
4. On the communication tab, select Protocols.
5. Click Edit and enter the administrator username and password:
    a. Default user (Case-sensitive) is Liebert
    b. Default password (Case-sensitive) is Liebert
6. Click to check the box next to Modbus RTU.
7. Click Save to confirm.
8. Enable Modbus Protocol:
    a. On the Communication tab, select Protocols>Modbus
    b. Click Edit and enter user name and password
    c. Select the access level Read Only
    d. Select the Modbus interface, Modbus RTU
    e. Click Save to confirm

9. Configure Modbus RTU:
    a. On the Communication tab, select Protocols > Modbus > Modbus RTU
    b. Enter the Node ID and Baud Rate
        i. Node ID defaults to 1, select a value from 1 to 247 that is unique among devices connected through the same Modbus Network
        ii. Select baud rate of 9600
        iii. Parity check = None
    c. Click save to confirm changes.
10. Restart the card:
    a. On the Communication tab, click Support
    b. Click Enable
    c. Click Restart

*More information is available in Vertiv Liebert IntelliSlot Unity Card Installer / User Guide (available on Vertiv website)

FUSION CONNECTIONS

Refer to your detailed engineering or the layout of your MODBUS network, respect the MODBUS best practises at all times by preventing star shape network, thus terminate 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).

Figure 3 C-7000-MOD

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 configure operating parameters as follows:

Communication Ports

COMRS485	Value	
Enter protocol (0: Terminal, 1: Mlink, 2: ISNMS, 3: MODBUS, 4: NONE, 5: Port fowarding, 6: Card reader)	MODBUS	
Enter baudrate (0=300, 1=1200, 2=2400, 3=4800, 4=9600, 5=19200, 6=38400, 7=57600 or 8=115200)	9600	
Enter character parameters (number of bit, parity, stop bit) 1: 8N1, 2: 8E1, 3: 8O1, 4: 7N1, 5: 7E1, 6: 7O1)	8N1	
Enter configuration (1-RS485(2 wires), 2-RS422(4 wires))	RS485(2 wires)	
Enter the number of IDLE char to wait (1 to 255)	5	
Enter device (0-None, 1-Modem)	None	

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
M3		**Value**
The module state is		Enabled
The name is		LiebertCrac01
The slave ID is		5
The port is		MLINK Port
The number of retry is		10
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		25

Configure the name of the Module using the reference name of the Genset, such as "Liebert DS"

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 Liebert Thermal management unit 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:

CHALLENGER 3000, CHALLENGER ITR, CW, DELUXE SYSTEM/3, DS, DSE, HPM, PEX, PDX/PCW WITH LIEBERT ICOM V4 CONTROLLER

Modules   [Edit]

M3A2	Value
The channel state is	Enabled
The name is	SPACE TEMPERATURE
The measure unit is	°F
The number of decimal digits is (4 = auto)	4
The bits for the mask used to extract value is	None
The strings associated to each code is	Not Programmed
The register address is	743
The reading function code is	4
The sign is	Normal
The data type is	16-Bit Integer
The sign is	Signed Integer
The multiplication factor is	0.1
The channel offset is	0

CRV WITH LIEBERT ICOM V4 CONTROLLER

Modules   [Edit]

M5A2	Value
The channel state is	Enabled
The name is	Return Air Temp
The measure unit is	oF
The number of decimal digits is (4 = auto)	1
The bits for the mask used to extract value is	None
The strings associated to each code is	Not Programmed
The register address is	388
The reading function code is	4
The sign is	Normal
The data type is	16-Bit Integer
The sign is	Signed Integer
The multiplication factor is	0.1
The channel offset is	0

CHALLENGER 3000, DELUXE SYSTEMS, HIMOD, ICS WITH LAM CONTROLLER

Modules   [Edit]

Modules

M10A1	Value
The channel state is	Enabled
The name is	Temperature
The measure unit is	°F
The number of decimal digits is (4 = auto)	1
The bits for the mask used to extract value is	None
The strings associated to each code is	Not Programmed
The register address is	1
The reading function code is	3
The sign is	Normal
The data type is	16-Bit Integer
The sign is	Signed Integer
The multiplication factor is	1.0
The channel offset is	0.0