

APPLICATION NOTE

Narada LFP BMS

Document Name: 2024-05_Narada_LFP_48MPLhe100_iO

Date (MM/DD/YYYY): May 2024

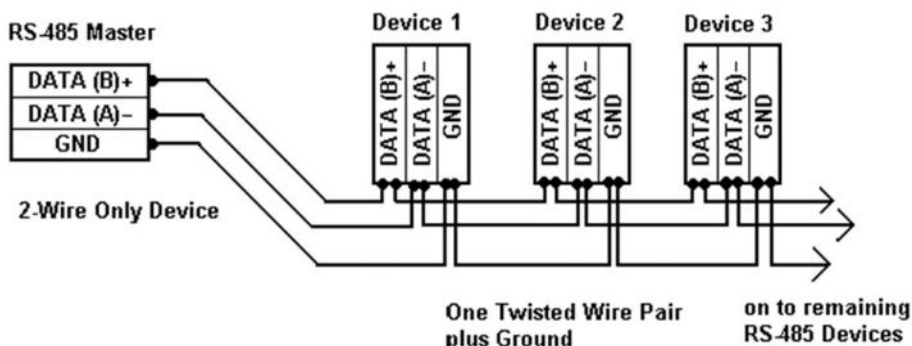
Purpose: This application note provides a step-by-step approach to integrate an intelligent Narada LFP battery with a Multitel iO device.



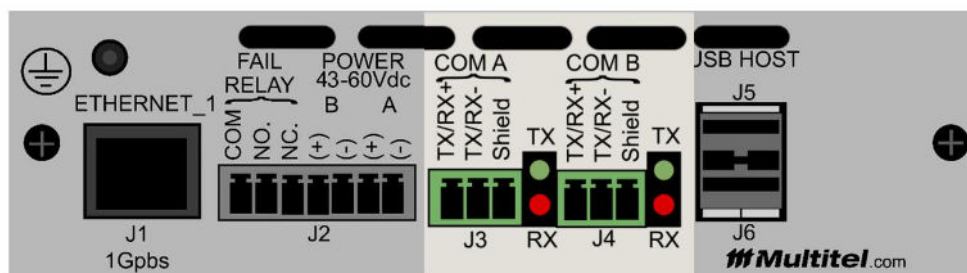
PRODUCT DESCRIPTION	
Name	MPL Series
Manufacturer	Narada
System Type	LFP Battery
Modbus Version	1.5.2
Manufacturer’s Technical Support	HTTPS://EN.NARADAPOWER.COM/CONTACT/INDEX.HTML
c	COMMUNICATION BETWEEN THE MULTITEL IO PRODUCT AND THE NARADA BATTERIES WAS CONDUCTED WITH THE NARADA MODBUS V1.5.2 USING A 48MPLHE100.

CONNECTING THE EQUIPMENT

MODBUS RTU over RS-485 must be wired in a daisy chain pattern. A star network is not advised as it can drastically modify the electrical characteristics of the RS-485 driver and can ultimately cause communication failures. The use of a good quality cable such as a 22-24AWG stranded, twisted shielded wire to perform the connection between each equipment is recommended. As the Narada batteries use a RJ-45 socket for the serial port, we also recommend using a CAT5 or CAT6 cable for this application. The polarity must be respected throughout the RS-485 network, otherwise communication failures will occur.



IO GATEWAY SERIAL PORT



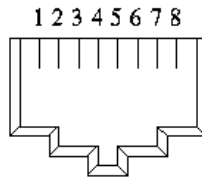
1. Locate the COMA connector on the back of the iO Gateway. Both communication port connectors are a three-pin screw terminal.
2. The Modbus network starts from the iO device and heads towards the first battery string.
3. Connect the wire to the following pin:

- a. J3 Tx / Rx +
- b. J3 Tx / Rx -

NARADA SERIAL PORT

The Narada MPL series uses a RJ-45 socket for the serial communication port.

RJ45 Pins	Definition
1	GND
2	RS485_A
3	RS485_B
4,5,6,7,8	No connection



EQUIPMENT COMMUNICATION SETTINGS

DIP SWITCH SETTING



The dip ranges from 0 to 15, and the BMS communication address is $38+x$, where x is the BMS dip code.

COMMUNICATION SETTINGS

Baud: 9600 bit/s

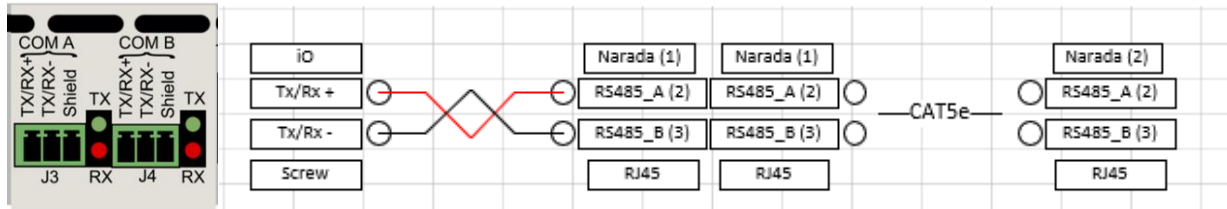
Parity: None

Data: 8 bits

Stop: 1 bit

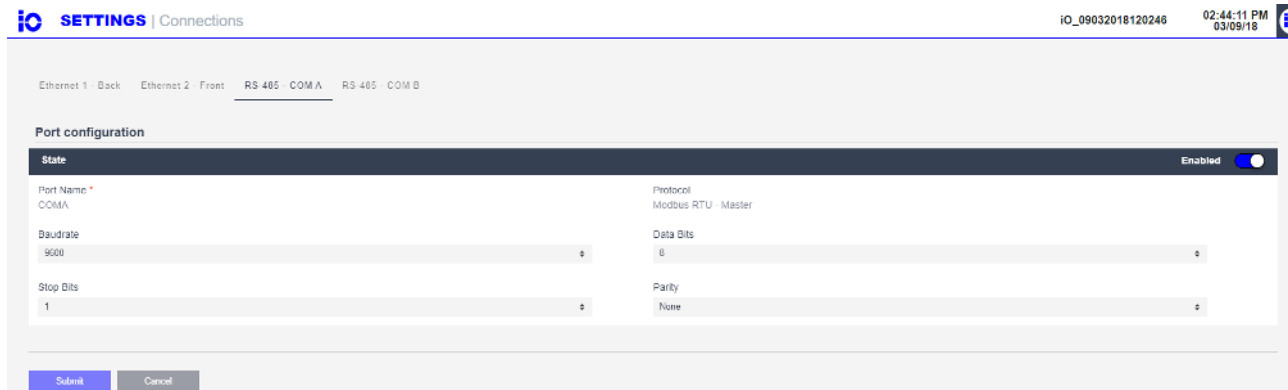
MULTITEL IO CONNECTIONS

The iO offers two (2) RS-485 ports, one called COM A and the other one COM B. End-of-line resistance is optional when using Narada Modbus communication. An end-of-line resistance of 120 ohms can help reduce signal reflection and reduce a communication error.



MULTITEL IO COMMUNICATION SETTINGS

Once logged into the iO using the administrator username and admin password, click on **Settings** from the left menu and select **Communication Ports**. Select the **COM A** or **COM B** port and configure the operating parameters as follows:



The screenshot shows the 'SETTINGS | Connections' page for an iO Gateway. The top right corner displays the device ID 'iO_09032018120246' and the time '02:44:11 PM 03/09/18'. The navigation menu includes 'Ethernet 1 Back', 'Ethernet 2 Front', 'RS 485 COM A', and 'RS 485 COM B'. The 'Port configuration' section is active, showing a 'State' toggle set to 'Enabled'. The configuration fields are as follows:

Field	Value
Port Name	COMA
Protocol	Modbus RTU - Master
Baudrate	9600
Data Bits	8
Stop Bits	1
Parity	None

At the bottom of the configuration panel, there are 'Submit' and 'Cancel' buttons.

- For more information on how to connect to the iO Gateway, please refer to the user manual at <https://www.multitel.com/resources/product-documentation/>

IO MODULE SETTINGS

Once the communication port is configured, click on **Data Source** from the left menu and select:

+ **Equipment**: Use the image below to create the new equipment.

Example of a Narada battery with dip code (Pack 1):



Equipment Edition

State Enabled

Equipment Name *
Narada BMS 1

Equipment Category *
Lithium BMS

Smart Equipment
Yes

Equipment Model *
48NPFC100

Communication Protocol *
Modbus RTU - Master

Manufacturer *
Narada

Communication Protocol - Modbus RTU

Serial Port *
RS-485 - COM A

Equipment Slave ID *
39

Slave *
10

Register Order *
Big-endian

Register Base Address *
Use given address

Polling Engine - Configuration

Equipment Polling Rate *
15 sec

Equipment Time Out *
5 sec

Number Of Retry *
5

Time Out After Retry *
5 min

Total Iteration Number *
5

Multi-Read

Save **Cancel**

Configure the name of the module using the reference name of the Fuel System, such as **Narada BMS 1**

IO TEST CHANNEL SETTINGS

Once the equipment is associated to a module, a list of channels will appear and will be available for Multitel to configure. However, in order to test the MODBUS RTU wiring and the Narada communication settings, it is highly recommended to configure a test channel as per the following for validation purposes. From the iO data source menu, click on **Actions, Data Point** to configure a channel to monitor the battery pack voltage.

Status	Equipment Name	Equipment Category	Equipment Model	Communication Protocol	Manufacturer	Equipment IP Address	Actions
●	Narada BMS 1	Lithium BMS	48NPFC100	Modbus RTU	Narada		***

The screenshot shows the 'DATA SOURCES | Equipment Data Point' interface. The main title is '[Narada BMS 1] - Data Point'. Below it, there are tabs for 'Analog' and 'Binary'. A 'Data Point' tab is active. The interface displays a table with columns: ID, Description, Equipment Modbus Register, Register Type, Data Type, Value, Advanced, and Connect. The table contains one entry: ID 'M1A11', Description 'Narada 1 - Pack Volt', Equipment Modbus Register '4095', Register Type 'Input Register', Data Type '16 bit integer', Value '53.20', and a 'Full Data' button. Below the table, there are input fields for 'Factor' (0.01), 'Offset' (0), 'IO Modbus Register', 'Polling Rate' (1 sec), 'Number of Retry' (5), 'Timeout after Retry' (60 min), and 'Total Iteration Number' (5).

Data Point Parameters:

- Name: Pack Voltage
- Register: 4095
- Register Type: Input Register
- Data Type: 16-bit Integer

Data Point Advanced Parameters:

- Factor: 0.01
- Offset: 0