

MICRO THERMO TECHNOLOGIES

MT-EEPR

Quick Setup Guide

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1 Introduction

1.1 Using this document

This guide is intended for technicians installing MT-EEPR modules. It is not a complete user guide, but rather a simple step-by-step summary of the basic instructions for the installation of an MT-EEPR module.

A complete user guide and a user manual covering specifically the stand alone operation (using the board's local interface) are available.

1.2 Conventions used in this document

For your convenience, several screen captures have been added to describe the procedures. Some images contain numbered balloons to help illustrate the procedure.

Finally, **bold** text is used for emphasis or to highlight technical terms.

2 Step by Step Procedure

It is assumed that the MT-EEPR module is powered and connected to the network.

The steps to install and configure the MT-EEPR module are:

2.1 Installation and configuration of the Sensor Nodes (Univ Sen Node MT500 or MT3208)

It is necessary to configure the Sensor Nodes (Univ Sen Node MT500) before installing the MT-EEPR modules. These sensor nodes, as of version 4.1, support calculations on air temperatures that are used by the EEPR nodes and on defrost termination temperatures used by the Circuit nodes.

The steps required to configure such a node are, typically:

- 1- Install a Sensor Node, as usual.
- 2- In the Sensor Node, go to the **Calculation** tab.

The screenshot shows the 'Sensor Node Information - sn1' window. The 'Calculation' tab is selected, indicated by a yellow callout bubble with the letter 'A'. The window is divided into several sections. On the left, there is a 'Remote Sensors' list with eight entries, each represented by a thermometer icon and the label 'NC'. The main area contains four 'Calculation Block' sections, labeled 'Calculation Block 1' through 'Calculation Block 4'. Each block has a 'Description' field, a 'Physical Type' dropdown menu (all set to 'Temperature (Absolute)'), and a 'Function' dropdown menu (all set to 'Average'). At the bottom right, there are three buttons: 'OK' (with a green checkmark), 'Cancel' (with a red X), and 'Delete' (with a trash can icon).

3- Click on the button (A). The following window opens:

sn1 - Calculation Block 1

Description: EEPR A1

Physical Type:
 Type: Temperature
☒ Absolute ☐ Differential

Function:
 Operator: Minimum

Sources:
 Local: ☒ 1 ☒ 2 ☒ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8
 Remote: ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Range:
 Maximum: 327.6 °C
 Minimum: -273.1 °C

Network:
 Max Send Time: 0 m 30 s
 Min Send Time: 0 m 3 s
 Send On Delta: 0.5 °C

OK Cancel

4- Configure the following points:

- A) Enter a description for the calculation block (Ex: Circuit using it)
- B) Select **Temperature** in the Physical Type drop-down list.
- C) Select the sensors that will be used in the calculations.
- D) Leave other default values as is.

2.2 Installation of the MT EEPR Module in MT Alliance

1. In the **Subsystems** menu, select your subsystem or click the desired subsystem button. In the **Mode** menu, select **Configuration**. When entering this mode, a **Components** toolbox appears in the bottom right corner of the window. It contains all the items that can be dropped in the view.
2. Select the view that you created at the previous step by clicking on the tab displaying its name.
3. Drag and drop a **Node** icon from the toolbox to your process system view. As soon as the icon is dropped, the **Node Definition** window opens. Select the item representing the site installation in each drop-down list. Click the **OK** button to finish or **Cancel** to delete the node.

The screenshot shows a dialog box titled "Pick Node Type and Model". It contains five dropdown menus arranged vertically. The first four are labeled "Transceiver", "Channel", "Node type", and "Manufacturer". The fifth is labeled "Model". The selected values are "TP/FT-10", "Backbone", "Custom Node", "Micro Thermo Technologies", and "Refrig EEPR V4.1" respectively. At the bottom right, there are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

*** To move an icon, select it and drag it with the left mouse button while holding the CTRL key.

After the node is dropped, it must be configured and associated with the controller. The Installation steps (steps 4, 5 and 6 below) are deferred in the case of an off-line configuration (the physical node being unavailable.)

1. Click the node icon. The **Custom Node Information** dialog box opens.
2. Select the **Details** tab.
3. Type a unique name for the node in the **Identification** field and, optionally, in the **Notes** field.
4. Select the **Commands/Status** tab.
5. In the **Installation** group, click the **Install** button.

6. The **Install a Custom Node** dialog box opens and requests you to press the **Service** button of the EEPR Node. For manual entry, please refer to the “Node Installation” manual. As soon as the node’s Service button is pressed, the software download begins. The plug-in loads the firmware into the node. Once the load is completed, the window buttons are activated.
7. Click **OK** to close the window.
8. Click **YES** to accept and save the changes.

2.3 Adding the Plug-in

At this stage, the MT-EEPR controller contains the firmware, but the CPs (Configuration Properties) still have default values. The EEPR Plug-In is used to enter site specific information; it calculates the CPs and loads them into the node. It is used also to monitor the process.

1. Drag and drop a **Plug-in** icon from the toolbox to the desired location on the view. Click on the plug-in icon to configure it.
2. The **Plug-In Information** dialog box opens.

Plug-In Button Configuration - Plug-in EEPR A-1

Details Configuration Log

Type: ☒ MI Plug-In ☐ LNS Plug-In

Scope: Node

Node Name: EEPR A-1

LonMark Object: <None>

Manufacturer ID: Micro Thermo Inc.

Plug-In Name: EEPR

Plug-In Version: 4.1

Visibility:

☒ Always visible

☐ Maintenance and Configuration

☐ Configuration only

Change Picture.. Run Plug-In

Alliance\Images\PlugIns\EEPR.bmp

From now on, "Shift - Click" or "Right - Click" on the Plug-In button to return to this form.

OK Cancel Delete

3. Type the information as it is shown in the table below:

Details Tab – General Group	
Identification	EEPRA1 P/g

Configuration Tab	
Type	MT Plug-In
Scope	Node
Node Name	EEPRA1
Manufacturer ID	Micro Thermo Inc.
Plug-in Name	EEPR
Plug-in Version	4.1

4. Click **OK** to save the settings and close the dialog box or click **Cancel** to undo the changes.

2.4 Network Variable Connections (Bindings)

Network variables need to be bound to other nodes, for normal operation. Connections are shown in the table below.

Please refer to the typical EEPR Configuration figure, on page 12, for a global configuration overview.

Output Node	NV	Input Node	NV
~RackA.SGr1	nvoSP	EEPRA1	nviSucGrXSP
~RackA.SGr1	nvoSpStPt	EEPRA1	nviSucGrXSPStPt
SNX	nvoUnivCalc1X	EEPRA1	nviAirTempX
~RackA.CkC1	nvoCircStatusX	EEPRA1	nviCircStatusX
EEPRA1	nvoStatusX	~RackA.CkC1	nviEEPRStatusX
¹ RTU1	nvoSpaceTemp	EEPRA1	nviSpaceTemp
RTU1	nvoRH	EEPRA1	nviSpaceRH

N.B Create all connections for all MT-EEPR modules and create necessary circuit bindings for all variable indicated by X5.

¹ The binding of nvoSpaceTemp and nvoRH may be deferred until HVAC nodes become available to provide ambient temperature and relative humidity.

2.5 Adding Custom Points to the Interface

Given the availability of data in the Plug-In's Process page, it is suggested to drop only three custom points for each circuit. They are described in the table below:

Circuit 1

Node	Id	Type	Physical Type	NV
EEPRA1	A1 Setpoint	Command	Temperature	nviAirTempStPt.Standby_cool
EEPRA1	A1 Temp	Measure	Temperature	nvoAirTemp.Standby_cool
EEPRA1	A1 % Open	Measure	Percent	nvoY_Pos1

Circuit 2

Node	Id	Type	Physical Type	NV
EEPRA1	A2 Setpoint	Command	Temperature	nviAirTempStPt.unoccupied_cool
EEPRA1	A2 Temp	Measure	Temperature	nvoAirTemp.unoccupied_cool
EEPRA1	A2 % Open	Measure	Percent	nvoY_Pos2

Circuit 3

Node	Id	Type	Physical Type	NV
EEPRA1	A3 Setpoint	Command	Temperature	nviAirTempStPt.occupied_heat
EEPRA1	A3 Temp	Measure	Temperature	nvoAirTemp.occupied_heat
EEPRA1	A3 % Open	Measure	Percent	nvoY_Pos3

Circuit 4

Node	Id	Type	Physical Type	NV
EEPRA1	A4 Setpoint	Command	Temperature	nviAirTempStPt.Standby_heat
EEPRA1	A4 Temp	Measure	Temperature	nvoAirTemp.Standby_heat
EEPRA1	A4 % Open	Measure	Percent	nvoY_Pos4

Circuit 5

Node	Id	Type	Physical Type	NV
EEPRA1	A5 Setpoint	Command	Temperature	nviAirTempStPt.unoccupied_heat
EEPRA1	A5 Temp	Measure	Temperature	nvoAirTemp.unoccupied_heat
EEPRA1	A5 % Open	Measure	Percent	nvoY_Pos5

2.6 EEPR Configuration Using the Plug-In

The following represents the most specific aspects of setting up an EEPR module.

- 1- Go to the **System** page and configure the following points:
 - a) Select the valve series. (Sporlan, Alco 12 Volts or Alco 24 Volts)
 - b) Enter the number of circuits on this module (1 to 5)
 - c) Select the type of refrigerant (R22, R507 or R404A)
 - d) Enter the value that you intend to use as a set point for the suction pressure (it will be used by default)

EEPR V4.1 - Plug IN EEPR

System | Circuits | Valves | **Process** | Board Layout | Log

Node Configuration

Node Type:

Valve Series:

Number of Circuits (On this Node):

Disable Board Interface (Use it Only for Display): ☒

Configuration Management

Name:

Plugin Status:

Environment Settings

Refrigerant Type:

Number of Suction Groups:

Default SG Set Pts as:

First Suction Group:

Default Set Point: psig

Network Settings

Receive Heart Beat: m s

Min Send Time: m s

Max Send Time: m s

Warning:

The Receive Heartbeat, Min Send Time and Max Send Time are field default values. Changing these values can alter the network traffic performance.

☒ Send ALL CPs

CPs updates pending

2- For each circuit, go in the **Circuit** page and configure the following points:

The screenshot shows the 'Circuits' tab in the MT EEPR V4.1 software. It contains five panels for configuring circuits 1 through 5. Each panel has the following fields and controls:

- Circuit Number:** C-1, C-2, C-3, C-4, C-5
- Valves (1-5):** Checkboxes for selecting valves.
- Nominal Load:** Spinners for values like 10000, 15000, 20000, 10000, 30000 btu/h.
- Default Air Temp Set Pt:** Spinners for values like -5.0, 0.0, -3.0, 0.0, 1.0 °C.
- Evaporator TD:** Spinners for values like 7.0, 7.0, 7.0, 7.0, 7.0 °C.
- Buttons:** Strategy Settings, Corrections Adjust, Reset, Delete.
- Calculated % Open (no Pid):** 6%, 12%, 13%, 8%, 26%.
- Current Circuit % Open:** N/A % and an Override button.

At the bottom, there is a status bar with 'CP's updates pending', a 'Send ALL CP's' checkbox, a 'Current Values' button, and 'Apply', 'OK', and 'Cancel' buttons.

- Select the valve assigned to the circuit (Typically, valve 1 to circuit 1, valve 2 to circuit 2, etc...)
- Enter the circuit's nominal thermal load (as given by the manufacturer, usually specified at 75°F and 55%RH ambient)
- Enter the intended air temperature set point (it will be used by default)
- Enter the nominal value of TD (TD being the temperature difference between the sensor and the saturated temperature of the evaporator (the nominal value is that specified by the case manufacturer, typically measured at 75°F ambient, 55% RH.) For refrigerated rooms, the TD as defined herein will be somewhat higher than that of the evaporator itself, because the sensor is usually installed in the return air flow. You may accept the suggested value if it is unknown.
- Click on **Strategy Settings** (see the "Settings" screen on the next page)
- Select the case's type: **Doors, Open** or **Coffin**
- OR** select the refrigerated room type: **With Doors** or **Open Area**
- Select the product type of circuit in the drop-down list
- If the circuit is equipped with high performance evaporators, clicking on the relevant check box will change the suggested TD, provided it has never been edited.

- j) If you specify the type of merchandise, the default values of the relevant parameters will be adjusted automatically, provided they have never been edited.

Circuit "C-1" Settings

Model

-50% Load Correction +50% x 1.00 = 20000 btu/h

Cases

☐ Doors ☐ Open ☐ Coffin

Rooms

☐ With Doors ☐ Open Area

High Performance Evaporators ☐

Merchandise Miscellaneous

Influence of Suction Pressure

☐ Use SP SetPt bindings from SPC

☐ React to Dynamic SP Value

PID

Bands for 2x Adjust Duration of Avg

Long Term 0.05 °C x 1.00 = 1 d 0h

Integral 0.10 °C x 1.00 = 1 h 0m

Proportional 0.5 °C x 1.00 = 15 m 0s

Instant 1.8 °C x 1.00 = 1 m 0s

Tolerated Temp. Error without Valve Adjust

Fast Slow Weak response 0.25 °C

Defrost

Inhibit Error Accumulation for 45 m

Advanced Settings OK Cancel

- 3- Go to the **Valve** page and configure the following points for each valve:

System Circuits **Valves** Process Board Layout Log

Valve 1

Status 1000 0000 0000 0000

Valve Model CDS-9

Uninstall

Control Circuit "C-1"

Suction Group SG-1

Current Valve % Open 100.0 % Circuit Dvrd

Valve 2

Status 0000 0000 0000 0000

Valve Model Unused Slot

Uninstall

Valve 3

Status 0000 0000 0000 0000

Valve Model Unused Slot

Uninstall

Valve 4

Status 0000 0000 0000 0000

Valve Model Unused Slot

Uninstall

Valve 5

Status 0000 0000 0000 0000

Valve Model Unused Slot

Uninstall

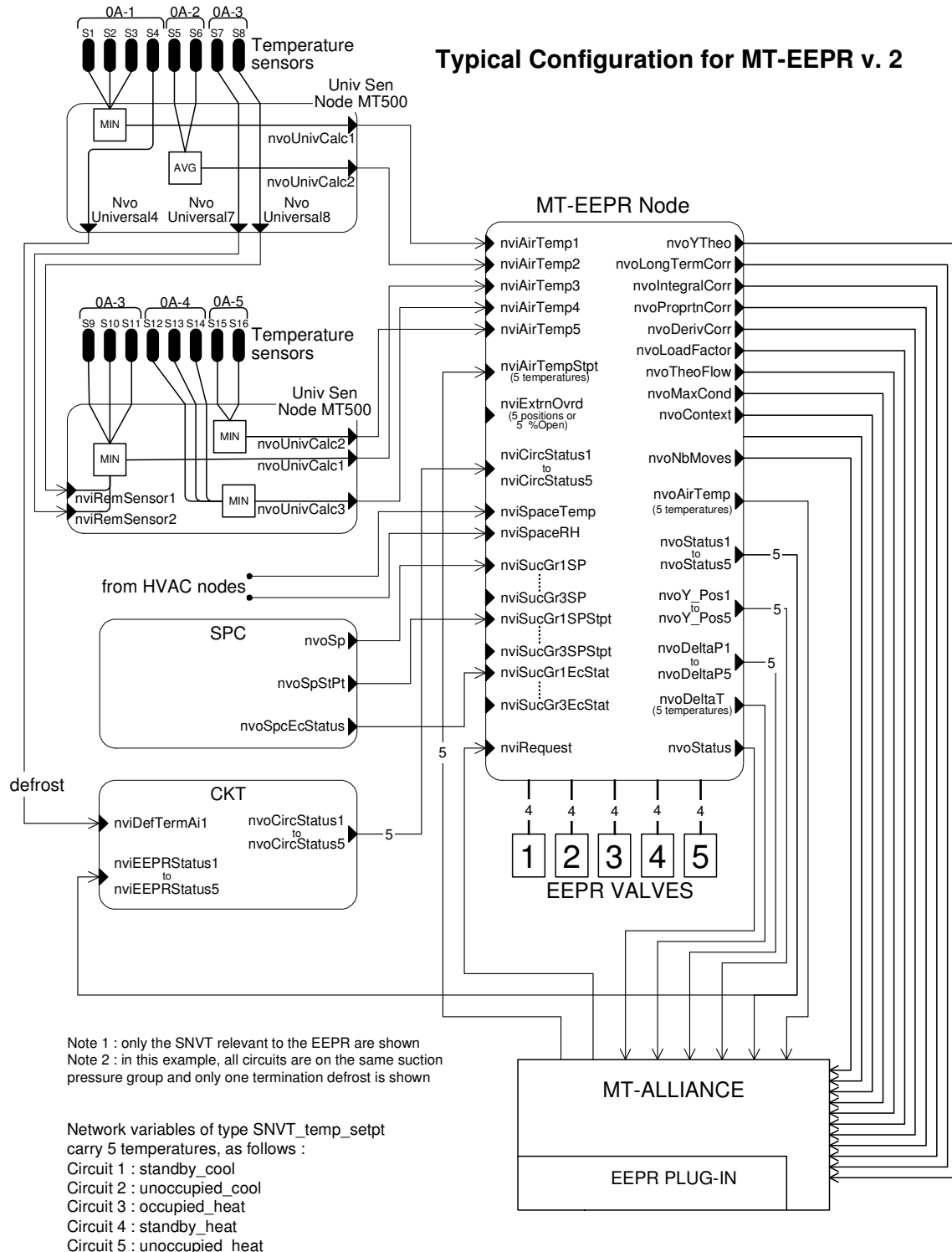
- a) Select the valve model in the drop-down list
- b) Select the control type in the drop-down list (**Circuit** in this case)

- c) Leave the default value (SG-1) for the Suction Group
- 4- Apply changes by clicking on the **Apply** button in the bottom of the plug-in window:

The process can now be monitored via the **Process** page.

3 Typical EEPR Configuration

The figure below shows the bindings between an EEPR node and the other nodes (SPC, Sensor, Circuit, HVAC) in a typical application.



4 Revision History

REV	Description	Revised by	Date
1.0	Creation of the document, translated from 71-GEN-0092	JG	30-jan-04
1.1	Revision	JFB	30-jan-04
2.0	Document interim Release	JG	03-feb-04
2.1	Revision	CB	04-feb-04
3.0	First Draft Publication	JG	04-feb-04
3.1	Title page Revision	RL	03-mar-04
3.2	Release for MT West (Draft Version. Need to be baselined)	JG	15-mar-04
3.3	Release for MT West take 2 with Eepr board named EEPRA1	JFB	20-avr-04
4.0	Publication	JG	21-avr-04
5.0	Publication (4.1.3 compatibility)	JG	21-jun-04)