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ABLING SMARTER ENTERPRISES

User Manual

SmartPoint T

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| **Product Code(s):** | 900.100.025.003 (SP3000T), 900.100.025.005 (SP3000TH), 900.100.025.008 (SP3000TERS), 900.100.025.010 and 900.100.025.011 (SP3000T1W) |

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1 Preface

1.1 What is the SmartPoint SP3000T

The SmartPoint(SP) SP3000T combines a high accuracy temperature sensor and extensive logging capabilities with wireless communication capabilities. Due to the devices extreme energy efficiency, it has long battery life. The SP3000T is intended for static deployment in, for example, cool cells or temperature controlled warehouses, or mobile deployment, for example, attached to temperature sensitive produce. The temperature samples are conform EN12830 (type D). Optionally, the temperature sensor of the SP3000T can be calibrated (service sold separately, including calibration certificate).

The SP3000T operates inside any 3000 Series wireless network consisting of a ConnectGate(CG) or Gateway(GW) and MicroRouters(MRs). As soon as the SP3000T is activated and is in range of an infrastructure device, it will start reporting the temperature[1] at a 5 minute interval. Optionally, the SP3000T can be configured for different reporting rates and for smart alerting based on temperature measurements. Temperature measurements are stored for up to 28 days in the SP3000T.

1.2 Features

1. **Accurate Temperature Sensor**

   The internal TMP102 temperature sensor ???

2. **Low Power**

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[1] Assuming factory settings of the ESP3000T/H/CO2 and default security settings of the 3000 Series Infrastructure.

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The internal temperature sensor is best-in-class with regards to energy consumption and enables long-term battery-operated usage.

3. **Long Range**

The SP3000T has a combined Power Amplifier (PA) & Low Noise Amplifier (LNA) offering maximum radio range.

4. **Easy Installation**

Due to the fact that the SP3000T is powered by an internal battery, it can be configured and installed within minutes.

5. **Automated Logging & Flushing**[2]

The SP3000T has a 2MB internal Flash that is used to store up to 8K data samples. In case of temporary connection loss, the SP3000T will log its sensor readings and flush them fully automated once a connection is re-established, offering a high degree of redundancy and reliability.

1.3 Conventions

This user manual uses the following typographical conventions to mark certain portions of text: new terms, foreign phrases, and other important passages are emphasized in *italics*.

Everything that represents input or output of the computer, in particular commands, program code, and screen output, is shown in a `mono-spaced font` and separated by borders. Within such passages, italics (`example`) indicate place-holders; you must insert an actual value instead of the place-holder. On occasion, parts of program

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2 Logging & Flushing is NOT enabled by default.

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code are emphasized in bold face (`example`), if they have been added or changed since the preceding example.

Important comments or reminders are indicated in bold and separated by borders, as follows:

Example

An *administrator* is generally a person who is in charge of installing and running Ambient Studio or any other related system software. A *user* could be anyone who is using, or wants to use, any part of the Ambient Studio system or the devices of the 3000 Series Network. An *engineer* is generally a person who is in charge of physically installing, deploying, or maintaining 3000 Series network devices.

These terms should not be interpreted too narrowly; this user manual does not have fixed presumptions about system administration procedures.

1.4 Further information

Other available resources providing related information include:

- **FAQ**

   The FAQ list contains continuously updated answers to frequently asked questions.

- **Web Site**

   The Ambient Systems support website carries details on the latest release and other information to make your experience with Ambient Studio more productive. The support website can be found at:

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www.ambient-systems.net

The Support section can be accessed via login. Please contact our Customer Support via

support@ambient-systems.net

if you have not yet received the login details.

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2 Introduction

2.1 About This Manual

This manual provides practical information for using the SP3000T. It addresses first-time use, installation and mounting instructions, operation, storage conditions, etc.

2.2 Related Documentation

Document	Description
Data Sheet: SP3000T	The SP3000T data sheet contains detailed information of the SP3000T specification.
User Manual: Ambient Studio	The Ambient Studio user manual contains detailed information regarding Ambient Studio, our software package that can be used for configuring devices, support with installations, maintain networks, set up remote connections, etc.
Specification: DDI Class #11 TMP102	The DDI Class #11 specification contains the API of the SP driver that is installed on the SP3000T. It also contains useful information regarding device configuration, as well as the format of the temperature samples.

Data Sheets, White Papers, DDI Specifications and Manuals can be downloaded from the support section of our website www.ambient-systems.net.

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2.3 Required Tools

In order to verify proper operation of the SP3000T, the following devices and tools are required:

1. **Gateway**

   A GW with power adapter and serial cable.

2. **Laptop/PC**

   A laptop or Personal Computer(PC) is required to run Ambient Studio.

3. **Ambient Studio**

   Ambient Studio needs to be installed on the laptop or PC.

4. **USB to Serial converter**

   In case the laptop or PC does not have a COM port, a USB to serial converter.

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3 Product Types

There are four different types of the SP3000T, namely:

- SP3000T

- SP3000TH

- SP3000TERS

- SP3000T1W

The SP3000T only measures temperature. The other devices use this model as a basis and therefore also provide temperature samples, via the internal temperature sensor.

The SP3000TH provides humidity samples.

The SP3000TERS has an external reed switch which can be configured to send a message when the reed switch is activated or deactivated.

The SP3000T1W has an external temperature sensor which provides additional temperature samples.

The type of the SP3000T is indicated by the label on the exterior of the product.

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4 Installation

4.1 Preparation

Before the SP3000T can be installed, please ensure you have all the required tools available. It is strongly recommended to first read the User Manuals on the Ambient 3000 Series 3rd Generation Active RFID and Ambient Studio. Knowledge of Ambient Studio is a pre-requisite in order to verify the operational status of the SP3000T and associated configuration.

4.2 First Time Use

1. **Prepare 3000 Series network and Ambient Studio**[3]

   Ensure that Ambient Studio is running and a GW is powered, and properly connected to the PC. The GW needs to display an 'online' status in Ambient Studio. The green LED of the GW needs to be lit. MRs and other SPs can be added to the network as long as care is taken with regards to the network congestion. Navigate to the 'Drivers' tab in Ambient Studio and, if necessary, unfold the SP branch in the tree control on the left hand side of the screen.

2. **Awaken the SP from hibernation**

   Generally, the devices are delivered in hibernation to avoid unnecessary power drain. Use a Magnetic Mat(MM) to awaken the device, by following the instructions on the MM. Once awake, the SP will send a DDI (4:8:2) message to indicate that it has exited the hibernation state.

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3 Ensure your Ambient Studio version is the latest version available and that you have all required DDI XML files

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3. **Observe readings from SP in Ambient Studio**

Once awakened, the device will adopt operational status. The SP is now visible in Ambient Studio. In default configuration, the SP will report temperature every 15 minutes in a message from the DDI driver DDI(11:1:1) TMP::TMP102. In the 'DDI' tab of Ambient Studio, set the filter to select the ID of the device. The received queue should display all received DDI(11:1:1) messages.

If the aforementioned messages are being received, the device has started correctly and is operational.

If the SP does not report periodically, or sends out messages of DDI type FLUSHPUSH, it is possible that the device does not have a sufficient connection with the infrastructure. Use the Ambient Studio 'Map' view to visualize the infrastructure and SP links. When the DDI (3:9) Network::SmartPoint driver has been enabled, it will periodically PUSH network link quality information updates. If the reported RSSI values are approaching to the lower limit ???, either a MR needs to be added to the network, or the device needs to be moved closer to a MR or GW.

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4.3 Mounting

The SP3000T has a single mounting hole in the centre of the casing. This can be used in various ways to attach the device to the required surface, e.g. bolt and magnet, cord, or tie wrap.

5 Calibration

Ambient offers a calibration service which allows the calibration of the internal sensor(s). This calibration is performed by an independent certified calibration institute. Contact our support department for more information.

It is also possible to manually "calibrate" the sensor via the corresponding driver, e.g. DDI (11:1:1) Temperature:TP102.

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6 Powering Options

The SP3000T has an internal battery pack which, even in hibernation will be subject to a minute and continuous drain and should typically be replaced once every 5 years[4].

Ambient offers a refurbishment service for devices which require a battery replacement. Contact our support department for more information.

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4 Under the assumption that power loss occurs once every month for a period of 24 hours.

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7 LED Behavior

7.1 Awaken from hibernation

When the SP awakens from hibernation, the device will flash the internal LED several times.

7.2 Rapid Response mode

After awakening from hibernation, the device enters a rapid response mode for a period of 15 minutes. During this period, the device will flash the internal LED every 30 seconds.

7.3 Normal operation

During normal operation (default configuration), the SP does not flash the internal LED.

It is possible to configure the SP to flash the internal LED upon status change of the internal reed switch. See DDI (17:2) Contact:Reed for more details.

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8 DDI Drivers

The following DDI drivers are installed on the SP3000T

- DDI(0:0)   System::DDI

- DDI(0:1)   System::Echo

- DDI(0:2)   System::Version

- DDI(0:3)   System::FileSystem

- DDI(0:4)   System::Reset

- DDI(0:10)   System::SmartPointPower

- DDI(0:12)   System::Logger

- DDI(0:13)   System::KeyManager

- DDI(0:15)   System::SmartPointLED

- DDI(3:5)   Network::RapidClient

- DDI(3:9)   Network::SmartPoint

- DDI(3:10)   Network::SmartPointExtendedSleep

- DDI(4:8)   Utility::Hibernate

- DDI(11:1)   Temperature::TMP102

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The SP3000TH has the following additional driver:

- DDI(12:1)   Humidity::SHT-H

The SP3000ERS has the following additional driver:

- DDI(17:1)   Contact::OpenClose

The SP3000T1W has the following additional driver:

- DDI(11:5)   Temperature::DS18B20

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9 Storage

The SP3000T should be stored in a dry area at room temperature.

10 Disposal

All SP3000T products are considered Waste Electrical and Electronic Equipment (WEEE) and should be disposed of accordingly. If you have any questions regarding this matter, please contact our support department.

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11 Appendices

11.1 Appendix A: Technical Support

You can contact Ambient Systems technical support through our web site or by email. Before you contact technical support, please have the following ready:

1. Ambient Studio version (see About box)

2. Device serial ID, model number

If you have encountered any problems, please visit the support section of our website, where you can find software updates and user documentation, as well as Frequently Asked Questions (FAQ) and answers to technical issues.

Website:	www.ambient-systems.net
	Then browse to the support section
E-mail:	support@ambient-systems.net

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