

# @ANY Smart MAC Suite

Easy-to-use embedded software for the control of our @ANY platform's functionality via AT commands, and flexible commissioning.

A.N. Solutions applies the same modular approach in software, as it does in hardware. Various embedded software components are designed to interoperate seamlessly and can be easily mixed-and-matched depending on the exact needs of a client. The A.N. Solutions' Smart MAC Suite (SMS) fully meets these requirements and is available for all @ANY platform components, including ZigBee Modules, USB Dongles and BRICK development boards. The SMS tool helps develop and deploy a Wireless Sensor Network (WSN) of choice, based on IEEE 802.15.4 standard with an easy-to-use programming interface.

Smart MAC Suite includes several software parts (figure 1., page 2). In addition to the support of the RF portion, it also takes care of the GPIO control logic, the temperature sensor on the @ANY Brick board and several other interfaces, such as the UART interface to interact with a host. SMS is utilizing a Media Access Controller, which implements all IEEE802.15.4-2006 functions. And since there are applications out in the field, which cannot afford an additional host intelligence, A.N. Solutions implemented features in SMS, which allow it to run a network node **without any further intelligence**. This means that **no host is required**.



SMS Base and SMS Pro

## Key Features

- Easy control of @ANY platform's functionality via AT commands supporting all IEEE 802.15.4-based functions:
  - Device scans: searching for networks
  - Device association and disassociation: joining or leaving a network
  - Direct data transmission: acknowledged or unacknowledged (only available with SMS Pro)
  - Indirect data transmission
  - Data broadcasting (only available with SMS Pro)
  - Several other features of the IEEE 802.15.4-2006 standard
- Provides a simplified, widely common communication interface using a standardized AT command set via the RS232/UART interface that allows controlling the majority of @ANY platform features and enables flexible commissioning
- Included application examples allow to establish Peer-to-Peer (P2P) & Star networks with supported data throughput of up to 250 KBit/s
- Optional advanced features include frame redirection to establish tree structured networks, a library to create feature enhancements by adding custom C code, and more

## Benefits

- ✓ @ANY modules can be connected directly to a host processor as a communication extension, whereas the @ANY module's interfaces enhance system capabilities by adding additional sensors and actuators
- ✓ User can program @ANY Platform via S-Register mapping and AT-Commands. No embedded programming skills needed.
- ✓ Complimentary A.N. Solutions SMS Profiler utility simplifies such modifications
- ✓ Full IEEE 802.15.4-2006 functionality to users
- ✓ Users can set up basic network topologies: peer-to-peer, star, tree and mesh (lightweight mesh and customized applications)
- ✓ Acknowledged and unacknowledged data packages can be transmitted directly or broadcasted
- ✓ Comprehensive example sensor support implemented at @ANY BRICK platform such as Temperature (LM73), Humidity & Dewpoint (SHx2x), Acceleration (BMA25x) and module depending number of GPIO's
- ✓ Functionality enhancements, including support of custom sensors and implementation of external host intelligence directly into @ANY module, are available on request
- ✓ Integrated serial bootloader simplifies firmware upgrades

## Applications



Smart Buildings



Smart Energy & Metering



Industrial Automation



Healthcare & Fitness



Retail



Agriculture



Automotive & Transport



Smart Cities & Environment



Event Management

# Software Modules

@ANY Smart MAC Suite („SMS“) is provided in two different versions, SMS Base and SMS Pro, which characteristics and features are fully adjusted to the main purpose of application and development

## @ANY SMS Base

The Base version provides basic functionality designed for simple network topologies and evaluation purposes. It can be used to set up Coordinator - End device (star, peer-to-peer) topologies which are used, for example, in basic Wireless Sensor Networks.

## @ANY SMS Pro

The Pro version facilitates development of more complex applications and supports additional tree topologies with static routing, based on IEEE 802.15.4 MAC layer, along with a number of versatile example applications. Moreover, SMS Pro provides additional features like data broadcasting and full function device functionality. The data redirect feature enables users to set up tree network topologies. Finally, SMS Pro is designated to be a code base for customer requested extensions. By utilizing the supplied library version, a developer can extend functionality by linking against his own C code. This provides maximum flexibility and enables integration of external host intelligence directly into @ANY module, support of additional sensors, and more.

## @ANY SMS Monitor

Both versions will be complemented by @ANY SMS Monitor, a simple, user-friendly GUI for network monitoring, which is an example of an application-driven extension. A serial bootloader simplifies firmware upgrades. The possibility of making configuration data reads and writes through the serial interface further simplifies semi-automated device commissioning.

## @ANY Mesh Support

Mesh networking topologies that support dynamic routing schemes based on IEEE 802.15.4 can be implemented and customized on customer's demand. By default Lightweight Mesh software will be provided as default example. Please refer to customization section for more details.

Feature	SMS Base	SMS Pro
Peer-to-peer Network	✓	✓
Star Network	✓	✓
Tree and Mesh Networks	–	✓
Frame Redirection	–	✓
Dedicated Sensor Support	✓	✓
GPIOs (8 in/output lines, 2 lines for input and event trigger)	✓	✓
Sleep Mode	✓	✓
Data Transmission (direct/indirect)	✓	✓
Data Transmission (acknowledged)	✓	✓
Data Transmission (unacknowledged, broadcast)	–	✓
Bootloader	✓	✓
Library Version	–	✓
Vendor Support	–	✓

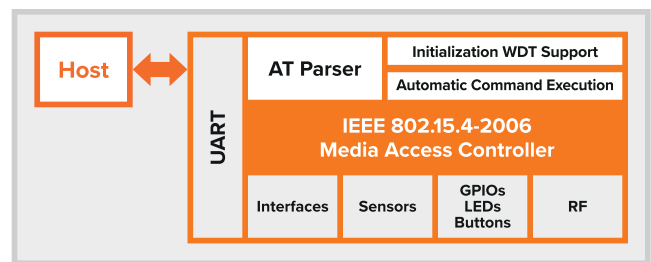


Figure 1. Basic SMS Structure

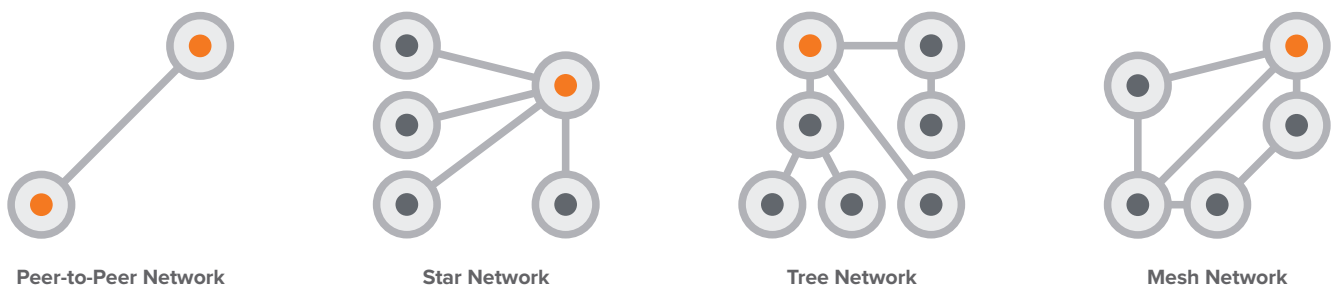


Figure 2. Network Configurations

## Further Information

For additional information or support, see [www.an-solutions.de](http://www.an-solutions.de) or contact us at [support@an-solutions.de](mailto:support@an-solutions.de). For more product details and ordering information, see the product data sheet.

