KEEPER v3.0 User Manual

Introduction

Thank you for purchasing the **Keeper v3.0**. This device is a modern autonomous security and remote monitoring system designed to protect and control assets in off-grid or remote locations. The Keeper v3.0 provides an **alarm system** and **remote control capabilities** for sites far from central infrastructure, operating via long-range radio communication.

The system offers reliable **wireless communication over at least 20 kilometres** in open areas. It uses the license-free **915 MHz ISM band** (Industrial, Scientific and Medical band) and **LoRa** technology (Long Range radio) to transmit data over long distances without the need for cellular networks or special radio licenses. In simple terms, Keeper v3.0 can monitor sensors and trigger alarms from very far away using its built-in radio link.

This user manual provides an overview of the device's main features and instructions on how to install, configure, and use the Keeper v3.0 system.

Package Contents

The Keeper v3.0 kit includes two main components:

- **Control and Management Unit** – The primary device that is installed at the remote site. It monitors the connected sensors and controls any external devices (such as sirens, lights, or other equipment) attached to it. This unit serves as the “field” device that gathers data (e.g. detecting intrusions or environmental changes) and sends alerts.
- **Monitoring Display** – A portable display unit used to receive data from the control unit, show status information and alarms, and allow the user to adjust settings on the control unit remotely. One monitoring display can track and manage up to **12 separate control units**, each with its own settings. The display stores individual configurations for each of these units, making it easy to monitor multiple remote sites from one screen.

Control and Management Unit

The Control and Management Unit (sometimes just called the "control unit") is the device you place at the remote location you want to secure or monitor. It collects sensor information, controls connected outputs, and communicates with the monitoring display via radio.

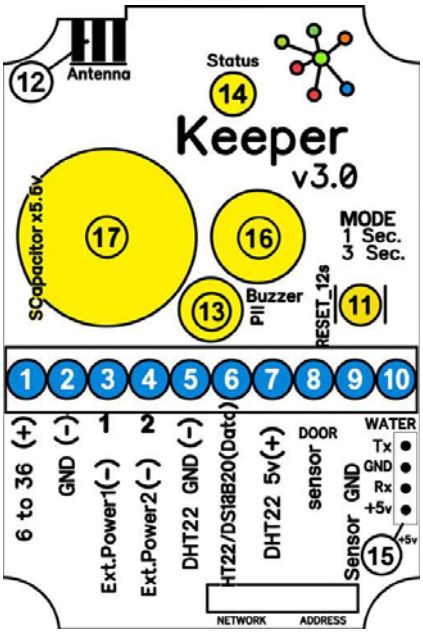
Installation and Placement

When installing the control unit, choose a location **protected from direct rain or snow** and, if possible, in an elevated position. Mounting the unit higher off the ground can increase the radio coverage area. Typical building materials like wood or foliage do not severely block the radio signal, but **metal structures or concrete** can significantly reduce signal strength. Also note that the 915 MHz radio signal travels line-of-sight and cannot penetrate hills or large terrain features, so ensure there is a clear path or minimal obstructions between the control unit and the monitoring display for best results.

Tip: If the device is in a metal enclosure or building, consider external antenna options (via the SMA connector) to improve range. The system is designed for open outdoor environments, so placement is key to achieving the maximum range of 20 km.

Components and Connections

The control unit has several connectors and built-in components. Below is an overview of the main elements and terminals of the unit, along with their functions:



1. **Positive Power Input (6–30 V DC)** – Connect this to the positive terminal of your power source. The device supports a wide DC input range from 6 V up to 30 V.
2. **Negative Power Input (Ground)** – Connect this to the negative terminal (ground) of the power source. This is the ground reference for the device.
3. **External Device Output 1 (Low-Side Switch)** – Negative output for the first external device or load. This terminal will **switch to ground (negative)** to activate the first external device (e.g. siren or light). It acts as a low-side switch for loads up to 30 V.
4. **External Device Output 2 (Low-Side Switch)** – Negative output for the second external device or load. This works similarly to output 1 above, but for a second device.
5. **Sensor Ground (for Temperature Sensor)** – Ground reference for external sensors. Used when connecting a temperature/humidity sensor (or any other sensor requiring a ground connection).
6. **Sensor Data Line** – Data input for an external temperature/humidity sensor. This supports sensors such as **DHT22**, **AM2302**, or **DS18B20**. Connect the data wire of the sensor here.
7. **Sensor Power Output (+5 V)** – A +5 V DC output to power the external sensor. Use this to supply power to the DHT22/AM2302, DS18B20, or similar sensors.
8. **Door Sensor Input** – Input for a door-open/closed sensor (or any switch-type sensor). This expects a **contact closure to ground** (negative) to register a state. Typically, a magnetic door switch can be connected between this terminal and the sensor ground (terminal 9).
9. **Common Sensor Ground** – Ground return for the door, water, or any other switch sensors. For example, one side of a door sensor connects to terminal 8 and the other side to this ground terminal 9, forming a circuit.
10. **Water Sensor Input** – Input for a water presence/flood sensor (or another switch-type sensor) that **switches to ground** when activated. One side of the water sensor connects here, the other side to the common ground (terminal 9).
11. **Mode Toggle Button** – The manual **mode selection button** for the device. Pressing or holding this button changes the operating mode of the control unit and can also reset settings (detailed usage described in the **Operating Modes** section). This button allows you to cycle through different monitoring modes without using the display, as well as trigger status reports or restore factory defaults.
12. **SMA Antenna Connector** – A connector for attaching the radio antenna. Connect the provided antenna here (make sure it is tightened snugly). You may also use an external or larger antenna via a coaxial cable for improved range, as long as it's tuned for 915 MHz.
13. **PIR Motion Sensor** – A built-in **Passive Infrared (PIR)** sensor that detects movement of people or animals up to about 5 meters away. This sensor is internal to the unit (on the front panel). **Note:** The PIR sensor will only be active in certain modes (by default, it is active in modes 1, 3, 5, 7 – see **Operating Modes** for details). Also, to function properly, the PIR sensor needs a direct line of sight to the area to monitor; it cannot detect movement through solid enclosures.
14. **Status LED Indicator** – A multi-color or blinking LED that provides **visual feedback** on device status, mode, and operations. For example, it may blink or change color during startup, mode changes, or alarms (specific patterns are described under **Startup and Indicators**).
15. **RS232 TTL Serial Port (5 V)** – A serial communication port for advanced use. This 4-pin connector allows connection to a computer via a USB-to-TTL serial adapter. It can be used to monitor debug information, view transmitted data, or send **AT commands** to configure the device. The serial port operates at **9600 bps, 8 N 1** (9600 baud, 8 data bits, no parity, 1 stop bit). *(Advanced*

users can send the command `AT+HELP?` over this serial port to get a list of available AT commands for configuration.)

16. **Buzzer (Audible Alarm)** – A built-in buzzer that provides **audible feedback** and alarm sounds. The device uses the buzzer to signal events like startup, mode changes, and alarm conditions (detailed under **Startup and Indicators**). It can produce a long beep and short beeps to indicate status or alert the user.
17. **Supercapacitor (Internal Backup Power)** – An internal supercapacitor that acts as a short-term backup power source. In the event of an external power loss, this component keeps the device running for a few minutes so it can send out critical alerts before shutting down. Unlike a battery, the supercapacitor is maintenance-free and not prone to fire hazards, but it only provides power for a very limited time.

Startup and Indicators

The control unit **automatically starts** when you connect power to the positive (terminal 1) and negative (terminal 2) inputs. On startup or any reset, the device will emit an audible sequence: **one long beep followed by a series of short beeps**. The number of short beeps indicates the current **operating mode number**. For example, if you hear one long beep followed by three short beeps, the device has started in **Mode 3** (see the **Operating Modes** section for what each mode means).

During operation, the built-in **LED indicator (13)** and **buzzer (16)** provide status feedback for the first hour after the device is powered on or after the last time the mode button was pressed. They may flash or beep occasionally to show the device is active and monitoring. After the first hour of continuous operation (with no button presses), the device **disables the LED and buzzer indicators**, entering a "stealth" mode so as not to draw attention. The unit will then operate silently and without any flashing lights, ideal for security scenarios where you don't want the device to be noticeable. (If you press the mode button again, the indicators will temporarily resume to confirm the mode or action, then again go quiet after an hour.)

Power Supply and Backup

The Keeper v3.0 control unit is designed to work with **standard 12–24 V DC power systems**, but it can accept anywhere from **6 V up to 30 V DC**. This flexibility means you can power it from a vehicle battery, solar setup, or industrial power supply, for example. At a 12 V supply, the device typically draws about **7 mA** in its normal monitoring state (idle) and up to **40 mA** briefly when transmitting data over the radio. It's very power-efficient during standby, making it suitable for off-grid use.

In the event of a power loss, the internal **supercapacitor (17)** will keep the unit running for a short period (a few minutes). This is usually enough time for the system to send a final **critical status report** over the radio (for instance, to report a power failure or any last-minute sensor readings). After that, the device will shut down until power is restored. The unit contains **no batteries or other flammable components** – the supercapacitor is the only backup power storage. This avoids maintenance issues and safety hazards associated with batteries, but remember that the runtime on the capacitor is limited to minutes, not hours.

External Device Outputs

The control unit can switch **two external devices** on or off, using the output terminals **3 and 4** (described earlier). These outputs work as **low-side switches** to ground. To activate an external device, the control unit internally connects the output terminal to the negative power (ground) terminal (terminal 2).

For example, you might connect a siren or floodlight between the positive supply and the Output 3 terminal. When an alarm condition occurs (depending on your configuration), the control unit will ground terminal 3, completing the circuit and powering the siren. When the output is off, terminal 3 is left floating (open), and the siren will be off. The same applies to Output 4 for a second device.

Each output can handle devices powered up to **30 V** and with a starting (inrush) current up to **50 A**. This means the outputs are capable of driving heavy loads or motors at startup (which often draw high current) even if the control unit itself is running on a lower voltage. Always ensure your wiring and connectors can handle the current if you plan to use high-power devices on these outputs.

Sensor Inputs and Connectivity

The Keeper v3.0 supports several sensor inputs for monitoring different conditions:

- **Temperature/Humidity Sensor:** You can connect an external digital temperature or temperature/humidity sensor to terminals **5, 6, 7**. Supported sensors include the popular **DHT22/AM2302** (temperature and humidity combined sensor) and **DS18B20** (temperature-only sensor). The wiring for these sensors is typically: sensor ground to terminal 5, sensor data output to terminal 6, and sensor's power (5 V) to terminal 7. The device will automatically detect if a supported sensor is present when it powers on. If you change or disconnect the sensor while the device is running, simply press the mode button briefly (a short press under 1 second) to have the control unit **re-detect the sensor** and update its status. The sensor can be located at a distance from the unit – the maximum cable length depends on the sensor's specifications and the quality of the cable. (For instance, the DHT22 or DS18B20 can often work over several meters of cable, but consult the sensor documentation for limits.)
- **Door/Open-Close Sensor:** A switch-type sensor (such as a magnetic reed switch for a door or window) can be connected to **terminal 8** (door sensor input) and **terminal 9** (sensor ground). This sensor is typically used to detect if a door, gate, or lid is opened or closed. The control unit registers a change **immediately** when the circuit between 8 and 9 is broken or made, regardless of how brief the event is. In other words, even a quick opening and closing of the door will be caught by the device. By default, the system can be set to treat the door sensor as **normally closed or normally open** depending on the selected mode (explained under **Operating Modes**). This flexibility lets you use either type of door switch.
- **Water Leak/Flood Sensor:** A water presence sensor (for detecting flooding or liquid level) can be connected to **terminal 10** (water sensor input) and the common **ground terminal 9**. This input is **deliberately designed with a 20-second delay (inertia)**. The sensor's state must remain stable for about 20 seconds before the device recognizes it as an alarm condition. This delay prevents false alarms from brief splashes or momentary moisture. For example, if using a water leak cable or float sensor, it needs to be continuously wet (or dry, depending on configuration) for 20 seconds before it triggers. Like the door sensor, the water sensor's **active state (wet/dry triggering)** can be configured as normally closed or normally open by selecting the appropriate mode.

Note: Both the door and water sensor inputs use an internal pull-up resistor to +5 V (about 4.7 KΩ). This means that if a sensor is not activated (or circuit is open), the input reads as a high voltage. When the sensor is activated (for instance, a door opening might break a normally-closed circuit, or a water sensor closing a circuit), the input goes to ground (0 V). The control unit interprets either the high or low state as the "alarm trigger" based on the mode you select. In simpler terms, **you can configure each sensor as normally-closed (circuit closed = normal, open = alarm) or normally-open (open = normal, closed = alarm)** by changing the mode. This gives you flexibility to match the sensor type you have installed without having to rewire anything – just pick the right mode in the device settings.

PIR Motion Sensor (Built-in)

The control unit comes with a built-in **Passive Infrared (PIR) motion detector** (terminal 13 in the components list) that can sense the movement of people or animals approximately up to 5 meters in front of the device. This is useful for detecting intruders or wildlife. **Important considerations for the PIR sensor:**

- The PIR sensor is **active only in certain operating modes**. By default, it is enabled in **modes 1, 3, 5, and 7** (and disabled in modes 2, 4, 6, 8). This allows you to choose whether motion detection is part of your security profile or not, by selecting an appropriate mode.

- The sensor **does not work through solid materials** like plastic or glass. It needs a direct line of sight to the area you want to monitor. The device's enclosure should have an opening or window for the PIR sensor. Keeper v3.0 may come with a special front panel that has a **hole or lens** in the center for the PIR sensor – use this panel if you intend to use motion detection. If your unit's cover is solid (no hole) and you want to use the PIR, you will need to carefully **drill a hole in the device's cover** to expose the PIR sensor. Make sure the hole is directly in front of the sensor and not obstructed.
- When active, the PIR sensor will instantly trigger an alarm event when it detects motion. Unlike the door sensor, which is either open or closed, the PIR sensor outputs a brief signal upon motion detection. The control unit will treat any such signal as a motion event (again, only in modes where PIR is enabled).

Operating Modes and Configuration

The Keeper v3.0 supports **eight (8) different operating modes**. These modes determine which sensors are actively monitored and how the device responds to certain sensors. You can change the mode using the **mode button (11)** on the control unit manually, or remotely via the monitoring display (discussed later). Each mode is essentially a profile of which sensor inputs are considered "armed" (active) and whether those sensors are treated as normally closed or normally open.

Using the Mode Button (Manual Mode Switching):

- **Short Press (less than 1 second):** A quick press of the mode button will make the device check for a connected temperature sensor (if you just added or changed the sensor, for example) and will immediately send a **status report** of all sensor states and system parameters to the monitoring display via radio. After releasing the button, the device will also beep a number of times to indicate its current mode number (as described in **Startup and Indicators** above).
- **Long Press (3 seconds):** Pressing and holding the mode button for about 3 seconds puts the device into *mode change* selection. When you release the button after 3+ seconds, the control unit will advance to the **next mode number** and confirm this by beeping the new mode number (e.g. 4 short beeps if it switches to Mode 4). If you press and hold again for 3 seconds, it will go to the next mode after that, and so on. You can cycle through modes in this manner. The modes wrap around after Mode 8 back to Mode 1 (Mode 8 is the highest mode).
- **Reset to Factory Settings (hold 12 seconds):** If you press and hold the mode button continuously for about 12 seconds, the device will **reset all settings to factory defaults** and revert to the original configuration. Use this only if necessary, as it will erase any customized parameters you have set. The device will reboot and start in the default mode (usually Mode 1) after this reset. During the 12-second hold, the status LED will blink each second to help you count and know when to release the button for a reset.

Overview of Modes:

Each mode defines which sensors are enabled and how they trigger. The table below summarizes the default behavior of the door sensor, water sensor, and PIR motion sensor in each mode (a checkmark ✓ means the sensor is active in that mode, and a cross ✕ means it is not active):

- **Mode 1:** Door ✓ (active, normally-closed), Water ✓ (active, normally-closed), PIR ✓ (active). *All three sensors are monitored.* This is the most secure mode, where if any sensor detects an issue (door opens, water detected, or motion sensed), an alarm/report is triggered.
- **Mode 2:** Door ✓ (active, normally-closed), Water ✓ (active, normally-closed), PIR ✕ (disabled). *Door and water sensors are monitored, motion sensor is off.* Use this mode if you want to detect door and water events but ignore motion (for example, to avoid false alarms from animals or if motion detection isn't needed).

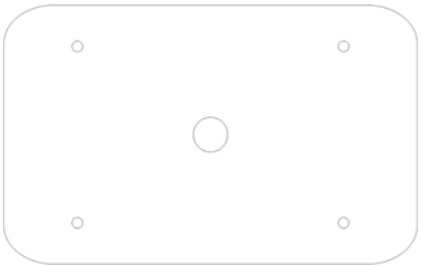
- **Mode 3:** Door ✓ (active, normally-closed), Water ✕ (disabled), PIR ✓ (active).
  Door and motion sensors are monitored, water sensor is off. Use when water detection is not needed, but you still want intrusion (door) and motion detection.
- **Mode 4:** Door ✓ (active, normally-closed), Water ✕ (disabled), PIR ✕ (disabled).
  Only the door sensor is monitored. This mode is useful if you only care about a door opening/closing and have no water sensor and do not need motion alerts.
- **Mode 5:** Door ✕ (disabled), Water ✓ (active, normally-closed), PIR ✓ (active).
  Water and motion sensors are monitored, door sensor is off. Ideal for situations where there is no door sensor or you don't want door alarms, but you do want to detect water leaks and motion (e.g., monitoring a basement for floods and intruders, without any door sensor).
- **Mode 6:** Door ✕ (disabled), Water ✓ (active, normally-closed), PIR ✕ (disabled).
  Only the water sensor is monitored. Use this if flooding or water leakage is the only concern at your site (and you have no need for door or motion alerts).
- **Mode 7:** Door ✕ (disabled), Water ✕ (disabled), PIR ✓ (active).
  Only the motion sensor is monitored. Use when you want to detect movement (people/animals) but do not have door or water sensors installed.
- **Mode 8:** Door ✕ (disabled), Water ✕ (disabled), PIR ✕ (disabled).
  All sensors off (monitoring disabled). This mode effectively puts the unit in a passive state where it will not trigger alarms on any sensor. It will still report status periodically (and you can still get temperature readings if a sensor is connected), but it won't react to door, water, or motion events. Mode 8 can be useful for maintenance, or if you temporarily want to suspend alarms.

Normally-Closed vs Normally-Open: For the door and water sensors, the term "active, normally-closed" (as in modes 1,2, etc.) means the system assumes the sensor circuit is **closed (grounded)** under normal safe conditions, and an **open circuit** will trigger an alert. "Active, normally-open" would mean the sensor circuit is expected to be open (not grounded) in normal conditions, and a **closed circuit to ground** triggers the alert. In the modes listed above, door and water sensors are by default treated as normally-closed (alarm on open) in the first half of the modes, and as normally-open (alarm on close) in the latter half. This arrangement lets you choose the appropriate mode based on the type of sensor you have:

- If your sensor is a **normally-closed type** (closed when secure, opens on alarm), use one of the modes where that sensor is marked "active, normally-closed" (for example, Modes 1–4 for the door sensor, or Mode 1,2,5,6 for the water sensor).
- If your sensor is a **normally-open type** (open when secure, closes on alarm), use a mode where that sensor is effectively treated as normally-open (Modes 5–8 for the door sensor, or Modes 3,4,7,8 for the water sensor). In those modes the device will trigger when the circuit closes.

The **PIR motion sensor** does not have a normally-open/closed state since it's an active electronic sensor—it simply triggers when it detects movement in modes where it's enabled.

By selecting the correct mode, you ensure the control unit responds appropriately to your specific sensors and situation. You can always change the mode later using the button or the monitoring display, so feel free to experiment to find the mode that fits your needs.



Monitoring Display

The Monitoring Display is the user interface unit for the Keeper system. It receives data from the remote control unit via radio, displays status and alarms, and allows you to configure settings for each control unit. The display is portable and can be placed indoors where you need to monitor your remote site.

Overview and Function

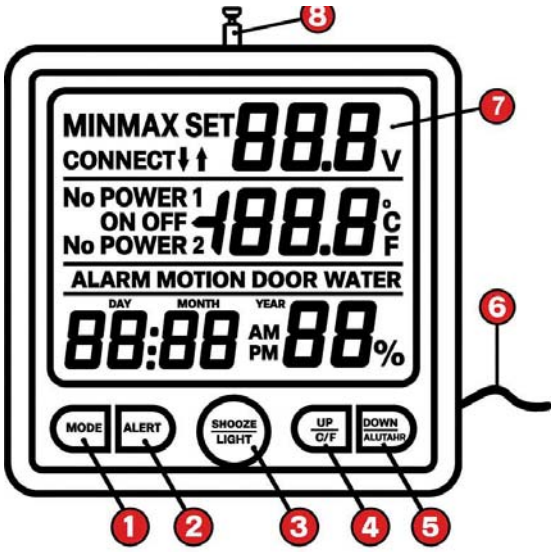
The monitoring display is responsible for **receiving, indicating, and logging data** sent by one or more control units. It shows you information like sensor readings (temperature, etc.), alarm conditions (door open, water leak, motion detected), and lets you adjust settings remotely.

- **Multiple Unit Management:** A single monitoring display can track up to **12 separate control units**. Each control unit is identified by an ID number, and the display can cycle through each unit's data. You can view and change settings for each remote unit individually from this one display.
- **Non-Volatile Memory:** The display unit stores the settings and configuration for all registered control units in its internal memory (which is non-volatile, meaning it remembers them even if power is turned off). **Note:** While the display remembers configuration settings (like alarm thresholds, modes, etc.), it does **not** permanently store the *last received sensor readings or status reports* from the control units. Those live data are displayed and kept as long as the display is on, but if you power cycle the display, it will start fresh with no current readings until new data comes in from the control units.
- **Initial Startup:** When you first power on the monitoring display, it will not immediately show any remote units or data because it has not yet received any transmissions. Each control unit will **register itself** on the display the first time it sends a data packet after the display is on. Until the display hears from a unit, it doesn't know that unit exists. So, if you have just set up the system, you may see an "empty" display or default screen initially. As soon as a control unit transmits (for example, on its regular interval or triggered by an event), the display will add that unit to its list and show its readings. The display will then retain that unit's ID and settings going forward.

Front Panel and Controls

The front face of the monitoring display contains the screen and several buttons. These controls allow you to navigate through unit data and menus, and to change settings. The main elements on the front panel include:

1. **Date/Time & Mode Button (Previous Item)** – This button is used to switch the display between showing the date and time or other modes on the screen. In the settings menus, this button also serves to go to the **previous value or option**.
2. **Siren On/Off Button (Next Item)** – Toggles the audible alarm (siren) output on the display unit itself (if the display has a built-in buzzer for alerts, this turns it on or off). In menu mode, this button moves to the **next value or option**.
3. **Backlight & Menu Button** – Controls the LCD backlight and also acts as a navigation and mode button:
    - A short press will toggle the **screen backlight** on or off (useful for viewing in the dark or saving power).
    - A short press also will advance the display to show the **next remote control unit's data** when multiple units are registered (cycling through unit 1, 2, 3, etc.).
    - Press and hold this button for about **3 seconds** to enter the **Settings Mode** for adjusting parameters. (While in Settings Mode, pressing this again for 3 seconds will exit settings and return to normal display.)



4. **Units / Increase Button (°C/°F)** – This button toggles the temperature units between **Celsius and Fahrenheit** on the display. In Settings Mode, it functions as the **"increase"** button to raise a selected value or scroll up through options.
5. **12/24h / Decrease Button** – This button switches the time display format between **12-hour and 24-hour mode** on the clock. In Settings Mode, it acts as the **"decrease"** button to lower a value or scroll down through options.
6. **USB Power Connector** – The display's **5 V USB power cable** attaches here. (On some models this may be a fixed cable or a USB socket.) This is how you power the display unit using the supplied USB cable and any standard USB power source.
7. **LCD Screen** – The main display screen that shows all information (sensor readings, statuses, menus, etc.). It is an LCD that may have sections for unit ID, temperature, signal strength, battery level, etc. The screen's layout will indicate various icons and data from the remote units.
8. **Telescopic Antenna** – A collapsible **antenna** attached to the display unit. This antenna receives the radio signals from the control units. It can be extended for better reception, especially when communicating over longer distances, and retracted when not in use or for portability.

Using these controls, you can navigate through different remote units and configure settings. For example, to change a setting, you would enter Settings Mode (by holding the backlight/menu button), then use the increase/decrease buttons to adjust a parameter, and use the next/previous buttons to cycle through different parameters or units. The specifics of the menu navigation will be shown on the LCD screen prompts.

Using the Display and Changing Settings

The monitoring display not only shows data but also lets you **send configuration changes to the remote control units**. Here's how it works:

- To browse data from multiple control units, use the appropriate button (as noted above, one of the buttons will move to the next unit's readings, and another to the previous unit or to switch modes like date/time display).
- To enter the settings configuration for a particular remote unit, **select that unit on the display** (make sure its data is currently shown), then press and hold the **Settings Mode button** (the backlight button) for ~3 seconds. The display will enter a configuration menu for that remote unit.
- Inside Settings Mode, you can navigate through adjustable parameters (like sensor thresholds, alert modes, scheduling, etc., depending on what Keeper v3.0 allows) using the Next/Previous buttons, and modify values using the Increase/Decrease buttons. The LCD will typically label the parameter you're adjusting.
- When you have made changes to the settings, **exit Settings Mode** (usually by holding the menu button again or using an exit option on the screen). The display will save the new settings in its memory. These changes are now queued to be sent to the remote unit.

The communication between the display and control unit works as follows: The display cannot instantly force the control unit to change settings; instead, it prepares the new configuration and waits for the next time the control unit **checks in (transmits data)**. Each time the control unit sends a report, the display will send back any pending new settings to that unit. The control unit will then apply the new settings and (in a subsequent report) confirm that it received them.

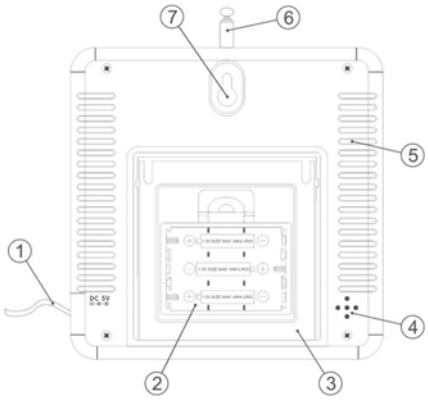
- The monitoring display will show an indicator (for example, an **upward arrow icon** next to the unit's ID on the screen) to denote that there are **pending settings changes** waiting to be sent to that unit.
- Once the control unit has received and applied the new settings (and the display gets a confirmation from the unit in a status message), the display will clear the pending status indicator (remove the arrow). If the display is turned off before the change is transmitted, the pending changes will be lost (so keep it on until you see the confirmation).

- All changed parameters for each unit are stored in the display's non-volatile memory, so even if the unit is out of range or powered off, the display keeps the desired new settings and will send them when possible. But again, if you power off the **display** itself, any unsent changes are cleared.

In summary, the display acts as a central control panel: you make changes on the display, and those changes propagate to the remote devices during their next communication. This approach ensures low power use on the remote unit (it doesn't have to listen constantly, only on its schedule) while still giving you control over its settings.

Rear Panel and Power Supply

Turning the monitoring display around, you will find several features on the back and sides:



1. **5 V USB Power Cable/Port:** This is where the display gets its power. Connect the supplied USB power cable here, and plug the other end into any standard 5 V USB power source (such as a phone charger, a computer USB port, or a USB battery pack). The display is designed to run continuously, so for permanent installations, use a quality USB power adapter. The provided cable can be extended with a USB extension cord if you need more length.
2. **Battery Compartment (3 × AAA Batteries):** The display can also be powered by three AAA batteries (not included) housed in the rear battery compartment. This battery option is intended for short-term or portable use. For example, you might run the display on batteries when walking around to find the best signal reception location, or during a temporary power outage. **Note:** If the display is connected via USB and also has batteries inserted, it will typically draw power from USB when available. The battery power is there for backup or short-term use. Because the display does not have a sleep mode and is always listening for signals, running it long-term on batteries alone will drain them quickly – for day-to-day use, an external 5 V power source is recommended.
3. **Flip-Out Support Stand:** A foldable stand is built into the back of the display. You can swing this **support leg** out to prop the display up on a table or flat surface. This makes it easier to read the screen when placed on a desk or shelf. When not in use or if wall-mounting, the stand clicks back into the body.
4. **Siren Speaker Holes:** These openings allow sound from the internal buzzer or siren (if the display has one) to be heard clearly. If an alarm is triggered or if you have the siren feature on, the sound will emit from here.
5. **Ventilation Slots:** Small slotted vents on the back help with ventilation and ensure the internal electronics (like the radio module and circuits) do not overheat. Do not cover these slots.
6. **Telescopic Antenna:** The antenna for the display unit is often mounted such that part of it extends at the back or top. It is the same antenna mentioned on the front panel description. Ensure it is extended upwards when in use to maximize range.
7. **Wall-Mounting Hole:** A keyhole-shaped hole or bracket at the top of the device allows you to hang the display on a wall screw or hook. This is useful if you want to mount the display on a wall for convenient viewing. Just ensure it's within reach if you need to press the buttons, or use the remote functionality if available.

Powering and Connecting the Display

When you plug the display into a computer's USB port for power, the device may also be recognized by the computer as a **USB-Serial device (CH340)**. This means you can optionally connect to the display from a PC to send commands or log data. Through this serial interface (accessible via a COM port on your PC), advanced users can adjust the display's settings and monitor all incoming/outgoing data using AT commands (similar to the control unit's serial interface). The communication settings for the display's USB

serial are the same 9600 bps, 8N1 format. In most cases, typical users won't need to use this PC connection, but it's available for diagnostics or advanced configuration. (Refer to Keeper's technical documentation for a list of AT commands, accessible via `AT+HELP?` on the serial connection.)

The display can run indefinitely from USB power. If you plan to use it 24/7, a good practice is to connect it to a reliable USB adapter or even a UPS (uninterruptible power supply) if monitoring critical sites, so that it stays on during power outages.

If using the battery power, remember it is mainly for **portable operation or testing**. For example, you might take the battery-powered display out around the property to see where reception from the control unit is strongest, before deciding where to place it permanently. Once you've optimized placement, switch back to USB power for long-term use.

Mounting and Placement Tips

You have flexibility in where to place or mount the monitoring display:

- **Desktop Use:** With the flip-out stand on the back, you can stand the display on any flat surface. This is convenient for a countertop or desktop where you can easily glance at the readings. Make sure to extend the antenna (usually vertically) for best signal pickup.
- **Wall Mounting:** Use the provided wall-mount hole on the back to hang the display on a wall at eye level. This keeps it out of the way and visible like a thermostat or alarm panel. When wall-mounted, ensure the antenna is extended and oriented generally upright.
- **Signal Reception:** Because the system uses radio communication, the placement of the display can affect signal quality. Try to position the display in a location that has a clear "view" toward the direction of the control unit's location. Avoid placing it right next to large metal appliances or in closets, as those can block the radio signal. The **telescopic antenna** on the display should be fully extended when in use – this significantly improves the range and reliability of the connection, especially for long distances. Collapsing the antenna will reduce the signal strength.
- **Antenna Usage:** The telescopic antenna is adjustable; angle it or rotate the base if needed to get the best reception (sometimes small adjustments can improve signal if you notice any issues). In extreme long-range cases, there might be options to connect an external antenna to the display as well, but for most users the built-in telescopic one is sufficient.

By following these guidelines for both the Control Unit and the Monitoring Display, you should be able to set up the Keeper v3.0 system effectively. The system will provide long-range monitoring and alerting for your remote site, ensuring you are notified of any important events (like intrusions or environmental changes) even from many kilometers away.

If you have any issues or need further assistance, please refer to the detailed technical documentation or contact our support team. Enjoy using your Keeper v3.0 for reliable remote security and monitoring!