

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS - REMOTE INDICATOR SM-12(AT) 24Hr. clock



**SM-12(AT) Monitoring Panel**

The SM-12(AT) **can monitor and power up to 12 Water Alerts** and will provide an alarm signal (red flashing LED's, audible buzzer, and relay outputs) if any sensor is activated. In addition, the unit **will automatically scan test all the connected detectors at preset time intervals**. The periodic scan test sends a test signal out to each detector in sequence. The Test Scan can be set for Weekly, Daily or Repetitive intervals. Capable of Manual Scan Initiate also. The System can be operated with less than 12 detectors. A sensing circuit in each Water Alert receives the test signal and electronically switches in simulated water conductivity across its sensing probes. A properly working Water Alert will send back a return signal. **Any Water Alert which does not properly respond to the scan signal will be indicated**. Each test scan of the SM-12(AT) assures that: all system wiring is intact and that the water sensing and send back circuit of all Water Alerts are operating properly. **This scan test automatically "exercises" the total system...which goes beyond other supervised systems**. Provides separate isolated relay contacts for customer use if water is detected or if any Water Alert fails the scan test. Any detector sensing water will transfer the "Water Alert Activated" latch relay (SPDT). (This relay will not transfer as a consequence of the scan test) . . . Any detector failing the scan test will transfer the "Scan Fail" latch relay (SPDT). Relay contacts are brought out to marked rear panel terminal strips. Contact rating 1 amp, 28vdc resistive.



### Dorlen Products

6615 West Layton Avenue, Milwaukee, WI. 53220  
Phone: 414-282-4840 Fax: 414-282-5670 E-Mail: Dorlen@execpc.com

**[www.wateralert.com](http://www.wateralert.com)**

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**GENERAL:** The SM-12(AT) is used in conjunction with Dorlen Products Water Alert model SS-2100 and VR-2100. If you are not familiar with the SM-12(AT) please review the catalog information sheet attached before proceeding.

Prior to energizing the Alert equipment, it is worthwhile to read the instruction packet. The instructions consist of a description of all controls, both internal and on the front panel. It is very important that the preliminary checks of the SM-12(AT) and a single Alert be carried out with the short test cable provided. This provides system familiarization prior to distributing the Alerts at distant locations.

1. Carefully unpack the SM-12(AT) and locate where 120VAC power is available. Remove the top cover and insert the line plug into the 120VAC wall outlet. Momentarily press the front panel "Reset" switch to reset. The SM-12(AT) is now cleared and monitoring. On the back of the SM-12(AT) is a battery ON/OFF switch. Turn the switch to "ON". This connects the internal back-up battery to the electronics. (Battery switch is left in the OFF position for shipment only.) With power initially applied, the front panel clock will be blinking and the day of the week lights may be cycling. To eliminate this condition, momentarily press the "Time Set" push button on the left side of the printed circuit and at the same time, momentarily press for a few seconds the adjacent "Fast" push button. Upon release of these two push buttons the clock indication will stabilize. The actual proper time set procedure will be considered later.

2. The purpose of each control is as follows:

**Internal Controls:** There are a few internal controls located on the left side of the printed circuit board. These controls are used only upon initial installation and thereafter are normally under the top cover. The purpose of the "Time Set" and "Fast" and "Slow" push buttons are to allow the electronic clock to be set to the proper time upon the initial installation. The "Day Advance" push button is to allow, again during initial installation, the proper day readout to be indicated on the front panel. The "Auto Scan" on-off switch is used to disable the automatic scan during initial installation or if it is necessary or desirable to eliminate this function at any time. When the "Auto Scan" switch is in the OFF position, coincidence of the actual time with the preset scan time will cause the Alerts not to be scanned. That is, it is necessary that the auto scan be in the

ON position for the automatic periodic time test to take place. When the "Auto Scan" is ON there will be a small red dot indication in the lower right hand corner of the electric clock readout. The "Manual Test" and the associated two six-position dip switches are to allow individual Alerts to be tested manually. This is useful in factory checkout and may also be used if there is a problem with a specific Alert or some confusion as to which Alerts are located where and so forth. Normally all twelve switches are left in the off position and only one dip switch should be switched on at a given time. Note dip switch position #1 is that position furthest from the front panel; position #12 closest to the front panel as indicated on the printed circuit (not the switch marking).

**Front Panel Controls:** Starting at the left side of the front panel the seven small red LED indicators will indicate the day of the week and are used in conjunction with the "Weekly" scan. The seven-day rotary switch below the electronic clock sets the day of the week that the scan test is to occur if the "Scan Interval" is set for "Weekly" scan. The electronic clock indicates the current time in 24 hour format when the clock has been properly time set. As stated earlier there is also a small red dot indication in the lower right hand corner that indicates the system Auto Scan is activated. Pushing the "Display Scan Time" push button at the right of the clock will cause the display of the time that auto scan has been set. As an example, if a "Weekly" scan test was desired at 3:00 P.M. on Wednesday, the rotary day switch would be turned to Wednesday and the "Scan Interval" switch to "Weekly". Pressing the "Display Scan Time" push button should show 15:00. When coincidence occurs between the preset scan time and the actual time, the system will automatically scan test the 12 Alerts. The "Scan Interval" rotary switch is used to select either Weekly, Daily or Repetitive Scan. On "Repetitive", the scan test will occur on a repetitive basis from a minimum of one scan approximately every 72 hours to a maximum of one scan every three hours. The "Repetitive Rate" knob is not calibrated but will adjust the repetitive scan rate between the ranges just indicated. In the Mid-position, repetitive scan will occur approximately every 30 hours. Note when switching to "Repetitive" the first interval between scans will be shorter than all subsequent intervals. The "Power On" LED lamp indicates that the system power properly exists either as a consequence of the power plug receiving power from the 120V source or from the internal rechargeable battery.

Should the power plug be removed or if the line power has failed, the internal rechargeable battery will power the system for 4 days after a power outage under normal conditions. Upon AC power return, the battery will automatically recharge. The "Single Scan Initiate" push button is used to activate a test scan at any time desired by momentarily pressing this button. Assuming for the moment that there are 12 properly working Alerts connected on positions #1 thru #12, the following sequence would occur when the "Single Scan Initiate" push button is depressed. Immediately the "Scan Cycle" LED will indicate and then in sequence each of the 12 LED indicator lamps will go on as each Alert receives its test signal and sends back a return signal. A period of approximately 60 seconds is required for all 12 LED indicator lamps to flash indicating that all Alerts are properly functioning. After a short interval of approximately 15 seconds, the "Scan Cycle" and the 12 LED's will go out. Consider for the moment that one of the Alerts is not functioning properly, let us say unit #11. During the "Scan Cycle" just described at the end of the scan (scan cycle lamp still indicating) all LED's will be indicating **except #11**. After approximately 15 seconds, the array of LED's will stop indicating (scan cycle lamp still indicating). There will be a short pause and then #11 LED will indicate as well as the small "Scan Fail" LED at the right of the 12 indicators. Thus the fact that Alert #11 is inoperative and has failed the scan test is latched into the system. #11 LED and "Scan Fail" will indicate until one pushes the "Reset" button momentarily. During the period that "Scan Fail" and #11 LED is indicating, whether this be hours or days, the remaining 11 Alerts are properly monitoring. If any of the monitoring Alerts sense liquid, the "Alert Activated" LED immediately indicates which Alert or which combination of Alerts have been activated will be indicated. As an example, if Alert #1 senses liquid, #1 LED will start to flash and "Alert Activated" lamp will also flash. If liquid seepage continues and Alerts #2 and #3 and #4 also detect Liquid, these lamps will come in sequence indicating that four Alerts have sensed leakage. The silence switch in the down position will disconnect the audible buzzer on the front panel. All other functions remain active.

**3. General Familiarization with the SM-12(AT):** It is desirable to perform a few preliminary checks prior to connecting Alerts to the (AT) indicator. With power applied to the '(AT) and the "Power On" lamp flashing and no Alerts connected, momentarily depress the "Single Scan" push button. Immediately the "Scan Cycle" LED lamp should indicate. The '(AT) is now scanning the 12 Alert positions. Since there are no Alerts connected the 12 LED's will not indicate during the initial portion of the scan cycle.

Because no Alerts are connected, no return signals are received on any of the 12 inputs. Thus, the '(AT) interprets this as 12 defective Alerts. Approximately 60 seconds after the start of the "Scan Cycle", the "Scan Fail" LED should indicate and all 12 LED's should indicate. The "Scan Cycle" lamp will go out at this time. Thus the system has scanned all 12 positions and determined that all 12 Alerts are "defective". Reset the system by means of the front panel "RESET" switch.

**4. Alert Detectors, General:** Unpack the individual Alerts which are to tie in to the SM-12(AT). This Alert must be model SS-2100 Water Alert. For general familiarization with the Alert Operating Principle, please refer SS-2100 instructions. Unlike all other Alert models, the SS-2100 does not require batteries or a PS-3 Power Supply. Rather they are powered from the SM-12(AT) annunciator box. The power comes in on the red lead of the 3-conductor cable which connects each Alert to the '(AT) annunciator.

**5. Familiarization:** For familiarization with the '(AT) Alerts and proper hook-up of the distant Alerts, one Alert should be checked locally. This is accomplished by using the short 3-conductor cable furnished with the red, green (or white), and black leads. This cable will allow a quick connection between the rear panel of the SM-12(AT) and one Alert. With AC power removed and back Battery switch "OFF" connect the short cable with the red lug ends to the #1 Alert rear terminal input: red wire to R, green (or white) wire to G, and black wire to B. By means of the wire nut connectors on the opposite end of the short test cable connect the cable red to red Alert pigtail, green (or white) to green, black to black as indicated on drawing #A9742. Check your connections and apply AC power to the SM-12(AT). Reset the system by means of the front "Reset" switch; wait 10 seconds. Touching wet fingers to the two Water Alert sensing probes or pushing the TEST push button on the Oil Alert should cause the unit to sound and at the same time signal channel one of the SM-12(AT) indicating that Alert #1 has sensed liquid. Reset the front panel switch and wait a period of 10 seconds. After this period of time has elapsed, depress the "Single Scan Initiate" button. The Alert should sound once and the #1 lamp again should indicate. Press the front panel "Reset". This combination of two tests verifies that the Alert is working properly. With power removed, connect all Alerts at their distant location following drawing #A9742. If different color wire than Dorlen Type "D" cable is used

be sure the green (or white) Alert pigtail connects to the "G" rear panel terminal. Black pigtail to "B" terminal and red pigtail to the "R" terminal. **Cross wiring can cause damage**; double check connections prior to applying power.

If it is desired to operate with less than 12 alerts connected to the (AT), it is necessary to put the small jumpers that are furnished on the particular position or positions that are not utilized. The purpose of these jumpers is to feed a false internal signal to the (AT) on any skipped positions, in order that "Scan Fail" does not occur due to an unused position. (See upper left-hand A9742)

After all Alerts are located in their final location within the building, the complete system should be tested. Any positions that do not have Alerts connected should have the jumper wire on the associated pins on the upper rear terminal strip as described above...Apply AC power and switch the "Battery" switch to on. "Reset" the system. Pressing the "Single Scan Initiate" should cause all 12 LED's to indicate in sequence as indicated in the preliminary checks paragraph. When it is established that all 12 Alerts are connected are properly working, proceed to the paragraph below.

**6. Clock/Scan Procedure\***: With the top cover removed and with the "Auto" switch on Off, depress the "Time Set" simultaneously with the "Fast" push button and observe that the clock advances rapidly. As the time indication changes from 23:59 to 0:00 it will advance the Day indication. As the actual time is approached within a few minutes, release the "Fast" push button and continue with the "Time Set" push button and the "Slow" push button simultaneously depressed to advance the clock until the actual time is indicated. By means of the front panel "Scan Interval" switch select "Weekly" or "Daily" if the scan is to operate automatically at a preset time. Press the front panel "Display Scan Time" push button momentarily. The clock readout will change from indicating the actual time to indicate the scan time which has been set. Continue to depress the "Display Scan Time" push button while at the same time (again by means of the "Fast" and "Slow" push buttons on the printed circuit board) advance the indication until the desired scan time is indicated. Releasing the "Display Scan Time" push button will again cause the electronic clock to read the actual time. By means of the "Day Advance" push button on the printed circuit board advance the day to the existing day. Thus the combination of the electronic clock display and the left column day display the time and day are now indicated. If the "Weekly" scan interval is desired, switch to the day of the week that the system should automatically scan. Thus if the system is set to "Weekly" and the "Scan Interval" switch is set to a Wednesday, the system will automatically scan test each Wednesday at the time

indicated when the "Display Scan Time" button is depressed. If the "Scan Interval" is set to "Daily" the automatic scan will occur each day at the preset scan time. **The "Auto" switch must be ON for the AUTO SCAN to function.**

When the scan is properly set up, it is possible to test this feature by rapidly advancing the "Actual Time" by means of the "Time Set" and "Fast" push button until the indicated "Actual Time" goes through and beyond the scan time that was preset. Verify that the system does automatically scan at the preset time. Reset the clock to the existing time and leave the "Auto" switch to ON. After the system is properly set the cover should be fastened and once more the single scan button should be used to scan through the system to verify proper operation.

**7. Relay Operation**: At the rear panel of the SM-12(AT) there are two 3-pin terminal strips which connect to two internal single pole double throw latching relays (C=common, NO=normally open, NC=normally closed). In the event that leakage is sensed by any Alert the "Alert Activated" relay will transfer and latch until the system is reset by the front panel "Reset". Note that the Alert Activated relay will not transfer as a consequence of the SCAN CYCLE.

If a "Scan Fail" condition occurs, the "Scan Fail" relay will transfer and latch until the system is reset.

The contact rating on the above two relays is 200V max.; .5 amp resistive (SPDT). **Caution**: If voltage greater than 24V is connected to the exposed terminal strip, a protective insulating cover should be provided by the user to avoid possible electrical shock.

**8. Power Loss**: In the event of 120VAC line power loss the system will transfer to the internal rechargeable battery (switch must be positioned to Battery "On"). During AC power loss the clock display will not indicate but because the internal battery is energizing the system the "Power On" indicator and Day indication lamps will continue to indicate. The system will continue to monitor and automatically scan at the preset time. An internal stand-by oscillator allows the clock to maintain time keeping such that when power returns the clock will ordinarily not have to be reset. Upon AC line power return, the internal battery will automatically recharge.

**9. Fuses**: The fuse values for F1 and F2 (rear panel) are F1 - 1/2 amp AGC; F2 - 2 amp AGC.

The SM-12(AT) system when properly set should function year-in/year-out without maintenance. In the event of problems during the initial setup, establish clearly what the system does or does not do that is improper and call Dorlen Products for technical assistance. 1-(800)-533-6392

**\*NOTE: Pressing the "Display Scan Time" push button temporarily disables the autoscan feature for 10 minutes**