Product: AM deactivator

Document: P1707 CP325-2 description V200116 1400

Version: 200116 1400

HW Version: CP325-2

FW version: P1707FWV1.1. production 191029 1353

Description:

The way the product works is explained below, in a chronological way, from the moment the device is powered.

- Startup
- Automatic synchronization
- Normal operation
- Check automatic synchronization

Besides that, the following possibilities are explained:

- Settings mode
- ASV
- Saved values
- Synchronization (manual/automatic)

FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off andon, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications not expressly approved by the party responsiblefor compliance could void the user's authority to operate the equipment.

Startup:

After powering up the AM deactivator, it will do the RGB LED test, first red, then green, then blue. After this, it will show the saved settings. First the SRS settings will be shown. SRS can be 1,2,3 or 4. The green LED will blink the number of times the SRS value is. At the same time, the buzzer will beep the number of times SRS is. The buzzer will do this at a frequency of 2750Hz (high tone).
After that, it will show the saved EAS settings. EAS can be 1,2 or 3. The blue LED will blink the number of times the EAS value is. At the same time, the buzzer will beep the number of times EAS is. The buzzer will do this at a frequency of 2300Hz (low tone).

Automatic synchronization:

The setting EAS is the Enable Auto Sync setting. 1 means OFF, 2 means ON with ASV as alternative, and 3 means ON with MSV as alternative. ASV is Automatic Synchronization value and MSV means Manual Synchronization Value. *For more information about synchronization, see chapter Synchronization.*

After showing SRS and EAS, the device will check the settings for automatic synchronization EAS and act upon it.

If EAS is 1, then the automatic synchronization is OFF. The device will then use the Manual Synchronization Value MSV as synchronization value. The device will now continue with 'Normal operation' without any notification.

If EAS is 2 or 3, then the automatic synchronization is ON. The device will now start to 'listen' if there is another device nearby that is sending out 58kHz bursts, like an article surveillance system (gate) or a nearby AM deactivator. It will listen for about 200ms. If it detects a 58kHz signal from a nearby system, it will synchronize to this signal. That means, it will save* and use this offset/synchronization value. This saved value is called the ASV or Automatic Synchronization Value.
* to prevent saving upon each startup, it will only save the newly found value if it is more than 100us different from the already saved value.

If the device does not detect any other device within 200ms, it will use the (previously) saved value ASV or the manual saved value MSV:
When the EAS setting is 2, the saved value ASV is used as the current synchronization value.
When the EAS setting is 2, the saved value MSV is used as the current synchronization value.

In this way, it nothing is found, it can fall back onto either the previously found automatic synchronization value (ASV), or the manual setting from the service operator (MSV).

The device will let the user know if it did or did not detect another system during automatic synchronization detection. If it did detect another system (automatic synchronization successful), it will blink the green LED and the buzzer will sound a two-tone low-high sound (2500-2750Hz, commonly identified as a successful operation). The device will now continue with 'Normal operation'.

If it did NOT detect another system (automatic synchronization unsuccessful), it will blink the red LED and the buzzer will sound a one tone low sound (1200Hz, commonly identified as an unsuccessful operation). The device will now continue with 'Normal operation'.

Normal operation:

After the startup and if used, the automatic synchronization, the device enters the normal operation. In normal operation the LED is blue.

The device sends 50/60 (or 100/120) times per second a 58kHz burst. When a tag is in range, the device will detect the tag and will send a demagnetize pulse. Immediately after that, the 58khz bursts will continue and the device will check if the tag is demagnetized by checking if it does not detect the tag anymore.

If the demagnetization is successful the LED will turn green and the buzzer sounds a high tone (3000Hz).
If the demagnetization is not successful the LED will blink red twice and the buzzer sounds a double low tone (2500Hz). In that case, the device will keep on trying to demagnetize the tag. It will try to do that for maximum of 10 times in a row. If it is still not demagnetized after 10 times, the device will go into a blocking mode until the tag is removed. During this blocking mode, the LED will blink red and the buzzer will sound a high-low tone (2500-2000Hz) every few seconds.

If during normal operation the pushbutton* is pressed for more than 5s, the LED will turn white and the buzzer will sound. After the pushbutton is released, the device will go into settings mode. See chapter settings mode.

The pushbutton is located behind a pinhole next to the RJ11 entry.

Check automatic synchronization

During normal operation and if automatic synchronization is turned on (EAS 2 or 3), every 10 minutes, the automatic synchronization check will be done. This will only happen when during minimum of 10s no tag has been detected. This check is made visible by turning the LED off for 200ms. During this time, a tag cannot be detected. If this automatic synchronization check will detect another device, it will check the detected synchronization time with the current used synchronization time. If these two differ for more than 100us from each other, the device will show this by blinking the LED red once every 10s as a warning. This warning will only be visible if a tag has not been detected for more than 5s, to avoid misconception. Even if a warning is active, the check will be done every 10 minutes. If the warning is active and the new check does not detect a different device, or it detects a different device but it has the same synchronization value (within 100us deviation), it can reset the warning. If the warning is reset, the red LED blinking disappears.

Be aware that the check does not change the used synchronization value. This happens only at startup if the EAS is turned on (2 or 3).

This check is obviously disabled if the EAS is 1 (automatic synchronization disabled).

Settings mode

If during normal operation the pushbutton is pressed for more than 5s, the LED will turn white and the buzzer will sound. After the pushbutton is released, the device will go into settings mode.

The pushbutton used to enter the settings mode is located behind a pinhole next to the RJ11-entry. One can use a paperclip or a sim-card tool to press the button. Care should be taken when pressing the button: Do not press too hard.

In settings mode, 3 values can be set: SRS, EAS and MSV. The value of ASV cannot be set in the settings mode, this will be saved automatically when a new ASV is found. For more information about ASV, see chapter Automatic Synchronization.

When entering the settings mode, SRS setting will be active first.

Save
To save the settings when in settings mode, press and hold the pushbutton again for more than 5s until the LED turns white and the buzzer sounds. Release the pushbutton and the settings will be saved.

If in settings mode and in setting SRS or EAS, the pushbutton is not pressed for more than 30s, the device will cancel settings mode WITHOUT saving. De LED will turn RED and the buzzer will sound.

If in settings mode and in setting MSV, the pushbutton is not pressed for more than 300s, the device will cancel settings mode WITHOUT saving. De LED will turn RED and the buzzer will sound.

SRS

SRS is Sensitivity Receive Signal. It is a setting that controls the digital sensitivity. A low number means less sensitive and a higher immunity. A higher number means more sensitive and lower immunity. SRS can be 1, 2, 3 or 4. In normal circumstances, it won't matter much what number the SRS settings will be. In areas where more noise could be present, it could be wise to lower the SRS setting. SRS is only the digital part of the sensitivity. It does not influence the analog circuit.

The LED will blink green the number of times corresponding with the setting of SRS. At the same time the buzzer will sound the number of times corresponding with the setting of SRS. If the pushbutton is pressed shortly, the number of SRS is increased by 1. If the number was 4, it goes to 1 again. The change is noticeable by watching the LED and listening to the buzzer. If the pushbutton is pressed for 2s and then released, the next setting will become active (AES).

EAS

EAS is Enable Automatic Synchronization. It is a setting that enables or disables and determines the behavior of the automatic synchronization. EAS can be 1, 2 or 3. If EAS is 1, the automatic synchronization is disabled. If EAS is 2 or 3, the automatic synchronization is enabled. Automatic synchronization is then executed at startup. Also, the automatic synchronization check is then enabled. If EAS is 2, and the automatic synchronization fails, the device will use the last found automatic synchronization value, called the ASV. If EAS is 3, and the automatic synchronization fails, the device will use the manual synchronization value, called the MSV.

If the pushbutton is pressed shortly, the number of EAS is increased by 1. If the number was 3, it goes to 1 again. The change is noticeable by watching the LED and listening to the buzzer. If the pushbutton is pressed for 2s and then released, the next setting will become active (MSV).

MSV

MSV is Manual Synchronization Value. This is the value that is used as synchronization value when the EAS is 1, or when the EAS is 3 and the automatic synchronization has failed.

Setting the MSV value is different than SRS or EAS. To set the MSV value, its best to view the 58kHz bursts on the oscilloscope using one or more pickup coil(s), setting the oscilloscope synchronization to sync the power grid net frequency (50/60Hz).

As soon as the MSV setting is activated, the device will output 58kHz bursts as how it would do in normal operation. It will do this at the zero crossing plus the MSV delay. The MSV value starts fixed, so the 58kHz burst will be at the same point after each zero cross of the power grid net frequency (50/60Hz).

Changing the setting can be done by letting the device move the 58kHz burst and stopping it where it should stop. To do this relatively easy, the device uses multiple moving speeds.

After pressing the pushbutton shortly, the 58kHz burst starts moving on the oscilloscope. It starts at the highest movement speed. Pressing the button again will slower the speed. There are 5 different speeds (from fast to slow), and after the 5th press, it stops (speed=0). This is confirmed by the buzzer with a short beep. Pressing the pushbutton shortly will start the 58kHz burst to move again at the highest speed. If needed, repeat it until the position is correct. The speed is confirmed by the LED. It will blink fast at fast speed, and it will blink slow on slow speed. It will be on without blinking when the burst is stopped (speed=0).

The position where the burst has stopped can be saved. To save the position, exit the settings mode like described in this chapter, under 'Save'.

Note: Only the position where the burst has been stopped will be saved. If the burst has been stopped but the movement is activated again, and the user tries to save the MSV value, the value where it has stopped the last time is saved.

If the pushbutton is pressed for 2s and then released, the next setting will become active, in this case it will go back to the first setting, SRS.

ASV – Automatic Synchronization Value

The ASV value cannot be set by the user. Therefore, it is also not visible in the settings mode. To check the current saved ASV value, one can change the setting to EAS=2 (if not already), restart the device (power off, power on) and ensure no other devices are turned on, so the automatic synchronization will fail. After that, the device will use the saved ASV as synchronization value. The device will start normally and now the ASV is visible on an oscilloscope. Use the oscilloscope like described in MSV.
For more information about the ASV value, see automatic synchronization.

Saved values:

The device has 4 values that can be saved to the internal flash memory: SRS, EAS, MSV and ASV.

SRS, EAS and MSV can be set in setting mode. ASV will be saved automatically when the device finds a new ASV value. See automatic synchronization for more information about when the device finds a new ASV value.

The internal flash memory can be rewritten for at least 10.000 times. This should be considered. Normally, the device will not often write a new value to the flash memory. In the exceptionally occasion where there is a lot of noise or a wrong setup with multiple devices with different synchronization values, it could be that the ASV value is rewritten every time the device is started (at power up and when EAS=2). If that happens once per day, then the lifecycle of the flash memory is 27 years.

Care should be taken to prevent this to happen that often that it influences the life expectancy negatively. For example, by only powering up the device once a day in a very noisy environment.

SRS: Sensitivity Receive Signal, see settings mode

EAS: Enable Automatic Synchronization, see automatic synchronization and settings mode

MSV: Manual Synchronization Value, see automatic synchronization and settings mode

ASV: Automatic Synchronization Value, see automatic synchronization

Synchronization:

The device will synchronize the 58kHz burst onto the 50/60Hz zero crossing with an offset. The offset depends on the settings. This offset is called the synchronization value (or in short sync value).
The Automatic Synchronization Value is called ASV.
The Manual Synchronization Value is called MSV.
The resolution of the Synchronization Value is 2us. When i.e. a synchronization value is 2ms, the saved number is 1000. (1000*2us = 2ms).