

MULTI~~OB~~FUSCATOR v2.00 CRYPTOGRAPHY & OBFUSCATION

Advanced file & text locking made easy, safe and free
EmbeddedSW, 2013

Send your suggestions, comments, bug reports, requests
to embedded@embeddedsw.net

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LEGAL REMARKS

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Features: why is this cryptography tool different from the others?

MultiObfuscator is a professional cryptography tool, with unique features you won't find among any other free or commercial software. MultiObfuscator is 100% free and suitable for highly sensitive data storage and transmission.

Let's take a look at its features

- [LAYERS OF SECURITY]

Data is encrypted (1), scrambled (2) and whitened (3).

[FEATURES: PROGRAM ARCHITECTURE](#)

- [LAYER 1 - MODERN MULTI-CRYPTOGRAPHY]

A set of 16 modern 256bit open-source cryptography algorithms has been joined into a double-password multi-cryptography algorithm (256bit+256bit).

- [LAYER 2 - CSPRNG BASED SCRAMBLING]

Encrypted data is always scrambled to break any remaining stream pattern. A new cryptographically secure pseudo random number generator (CSPRNG) is seeded with a third password (256bit) and data is globally shuffled with random indexes.

- [LAYER 3 - CSPRNG BASED WHITENING]

Scrambled data is always mixed with a high amount of noise. A new CSPRNG is seeded with a forth password (256bit) and data is bit-by-bit split according to a random permutation.

- [EXTRA SECURITY - DENIABLE CRYPTOGRAPHY]

Top secret data can be protected using less secret data as a decoy.

[WHAT IS DENIABLE CRYPTOGRAPHY?](#)

- [SOURCE CODE]

This program can be considered as a simple Windows GUI to the [LIBOBFUSCATE](#) system-independent open-source library. Users and developers are absolutely free to link to the core library (100% of the cryptography & obfuscation code), read it and modify it.

You're kindly asked to send me any libObfuscate porting/upgrade/customizing/derived sw, in order to analyze them and add them to the project homepage. A central updated official repository will avoid sparseness and unreachability of the project derived code.

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FEATURES: PROGRAM ARCHITECTURE

MultiObfuscator implements multi-cryptography (an advanced kind of [PROBABILISTIC ENCRYPTION](#)) joining 16 open-source block-based modern cryptography algorithms, chosen among [AES-PROCESS](#), [NESSIE-PROCESS](#) and [CRYPTREC-PROCESS](#). Cypher-Block-Chaining (CBC) wraps these block-based algorithms, letting them to behave as stream-based algorithms.

Whitening is the core of [DENIABLE ENCRYPTION](#)

- MultiObfuscator supports data and decoy (a 1st level of deniable encryption)
- MultiObfuscator is, by construction, not able to reconstruct the *Data* \leftrightarrow *Offset* association and, at unlocking time, has to slowly guess it by trial and error

[WHAT IS DENIABLE CRYPTOGRAPHY?](#)

Last OpenPuff/MultiObfuscator releases share some unique features with the [RUBBERHOSE FILESYSTEM](#) project (1997-2000). Independent and convergent evolution has lead different authors to focus their efforts on a common goal: [PLAUSIBLE DENIABILITY](#).

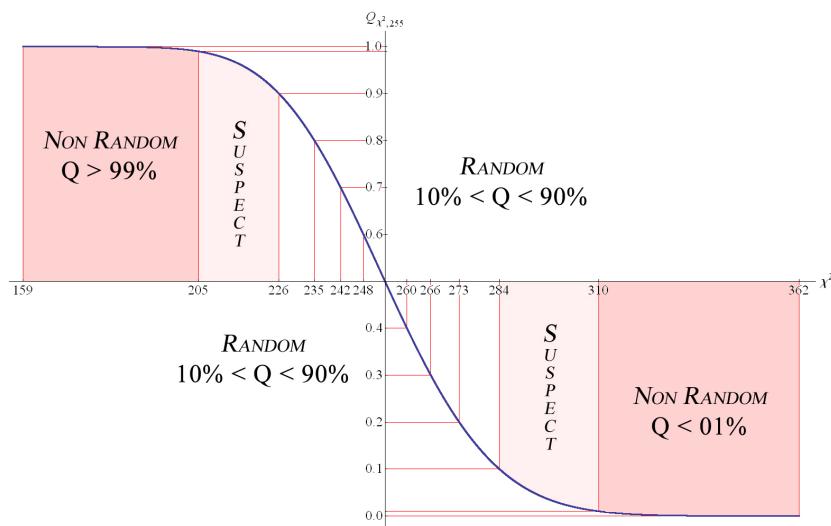
Rubberhose was (since it's no more maintained) a really advanced project introducing novel concepts

- **aspects**: users provide different passwords and get, from the same container, different data
- **plausible deniability**: the last-man-standing defense against legal and physical coercion

Years have gone by and, unfortunately, modern attackers wouldn't be deceived any more by whitening-only obfuscation. [BATTERIES OF STATISTICAL TESTS](#) for random number generators ([NIST](#), [DIEHARD](#), [ENT](#)) would easily detect the [RANDOMNESS DEGRADATION](#) of your container and, by direct relationship, the amount of data it's been hidden inside.

MultiObfuscator implements a χ^2 -[DISTRIBUTION](#)-driven self-adjustment:

- exceeds χ^2 -[DISTRIBUTION](#) 50% of the times ($Q = 0.5$), like a genuine random sequence created by [RADIOACTIVE DECAY EVENTS](#)
- scores a $\geq 98\%$ on the NIST randomness rating system



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FEATURES: MULTI-CRYPTOGRAPHY & DATA OBFUSCATION

FAQ 1: Why didn't you simply implement a standard AES-256 or RSA-1024?

Modern open-source cryptography

- has been thoroughly investigated and reviewed by the scientific community
- it's widely accepted as the safest way to secure your data
- fulfills almost every *standard* need of security

MultiObfuscator doesn't support any [CONSPIRACY THEORY](#) against our privacy ([SECRET CRACKING BACKDOORS](#), intentionally weak cryptography designs, ...). There's really no reason not to trust standard modern publicly available cryptography (although some old ciphers have been already [CRACKED](#)).

Some users, however, are very likely to be hiding very sensitive data, with an *unusually high* need of security. Their secrets need to go through a deep process of data [OBFUSCATION](#) in order to be able to *longer* survive forensic investigation and hardware aided brute force attacks.

FAQ 2: Is multi-cryptography similar to multiple-encryption?

Multi-cryptography is something really different from [MULTIPLE-ENCRYPTION](#) (encrypting more than once). There's really no common agreement about multiple-encryption's reliability. It's thought to be:

- [BETTER](#) than single encryption
- [WEAK](#) as the weakest cipher in the encryption queue/process
- [worse](#) than single encryption

MultiObfuscator supports the last thesis (worse) and never encrypts already encrypted data.

FAQ 3: Is multi-cryptography similar to random/polymorphic-cryptography?

Random-cryptography, a.k.a. [POLYMORPHIC CRYPTOGRAPHY](#), is a well-known [SNAKE-OIL CRYPTOGRAPHY](#). Multi-cryptography is something completely different and never aims to build some better, random or on-the-fly cipher.

MultiObfuscator only relies on stable modern open-source cryptography.

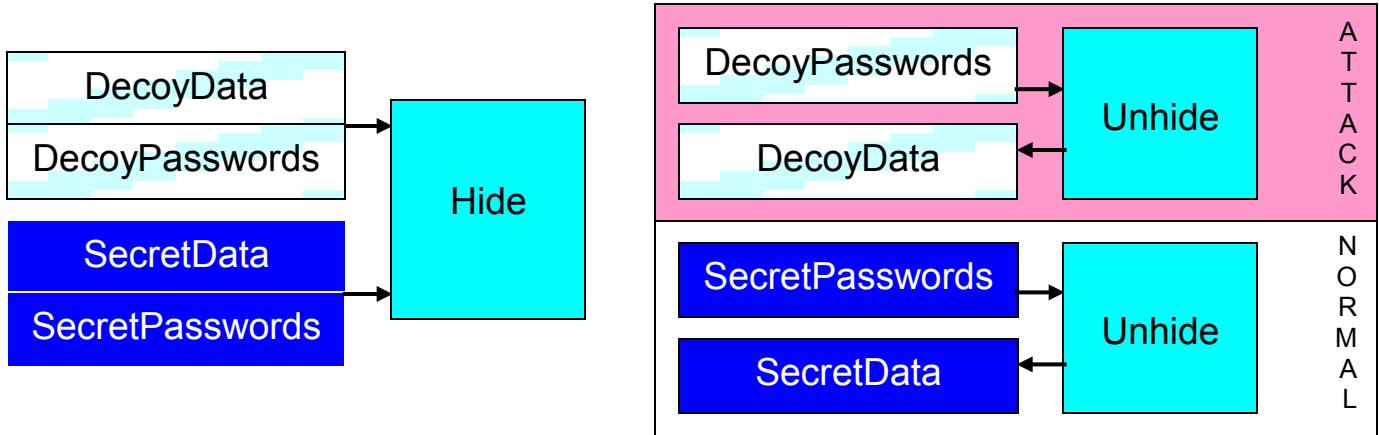
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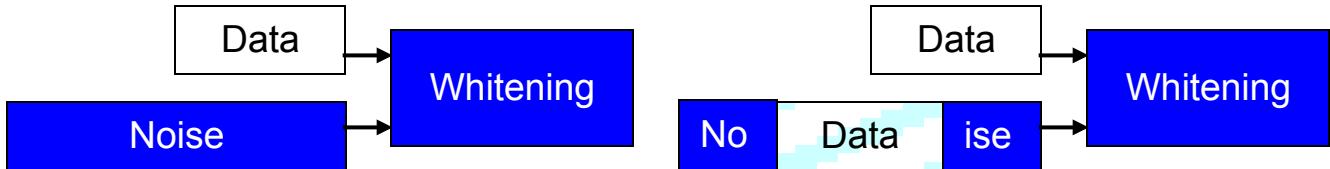


WHAT IS DENIABLE CRYPTOGRAPHY?

[DENIABLE ENCRYPTION](#) is a decoy based technique that allows you to convincingly deny the fact that you're hiding **sensitive data**, even if attackers are able to state that you're hiding some data. You only have to provide some expendable decoy data that you would [PLAUSIBLY](#) want to keep confidential. It will be revealed to the attacker, claiming that this is all there is.



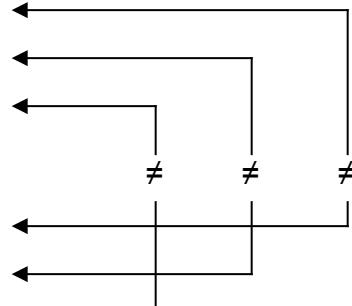
How is it possible? Encrypted and scrambled data is whitened ([FEATURES: PROGRAM ARCHITECTURE](#)) with a high amount of noise. Decoy data can replace some of this noise without loosing final properties of [CRYPTANALYSIS RESISTANCE](#).



Sensitive data and decoy data are encrypted using different passwords. You have to choose two different sets of different passwords.

Example:

Sensible data: Password (A) "FirstDataPssw1"
 Password (B) "SecondDataPssw2"
 Password (C) "AnotherDataPssw3"
 $(A \cap B) 70\%, (A \cap C) 67\%, (B \cap C) 68\%$, [HAMMING DISTANCE](#) $\geq 25\%$



Decoy data: Password (A') "FirstDecoyPssw1"
 Password (B') "SecondDecoyPssw2"
 Password (C') "AnotherDecoyPssw3"
 $(A' \cap B') 72\%, (A' \cap C') 60\%, (B' \cap C') 70\%$, [HAMMING DISTANCE](#) $\geq 25\%$

Each password has to be different (at bit level) and at least 8 characters long.

Example: “DataPssw1” (A) “DataPssw2” (B) “DataPssw3” (C)

(A) 01000100 01100001 01110100 01100001 01010000 01110011 01110011 01110111 00110001
(B) 01000100 01100001 01110100 01100001 01010000 01110011 01110011 01110111 00110010
(C) 01000100 01100001 01110100 01100001 01010000 01110011 01110011 01110111 00110011

(A ∩ B) 98%, (A ∩ C) 99%, (B ∩ C) 99%, HAMMING DISTANCE < 25% KO

Example: “FirstDataPssw1” (A) “SecondDataPssw2” (B) “AnotherDataPssw3” (C)

(A) 01000110 01101001 01110010 01110011 01110100 01000100 01100001 01110100 01100001 ...
(B) 01010011 01100101 01100011 01101111 01101110 01100100 01000100 01100001 01110100 ...
(C) 01000001 01101110 01101111 01110100 01101000 01100101 01110010 01000100 01100001 ...

(A ∩ B) 70%, (A ∩ C) 67%, (B ∩ C) 68%, HAMMING DISTANCE ≥ 25% OK

You will be asked for

- two **different** sets of different passwords
 - a stream of sensitive data
 - a stream of decoy data **compatible** (by size) with sensitive data
- $$\sum_{k \in \{1, N-1\}} \text{used_bytes}(\text{whiteBlock}_k) < \text{Sizeof}(Decoy) \leq \sum_{k \in \{1, N\}} \text{used_bytes}(\text{whiteBlock}_k)$$

Example:

whiteBlocks	Data bytes	SensitiveData	DecoyData
+Block (1/N)	32	32	Used
...	2016	2016	Used
+Block (N-1/N)	32	32	Used
+Block (N/N)	32	15	1 – 32
	Total = 2112	Total = 2095	2080 < Size ≤ 2112

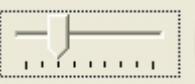
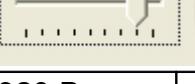
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OPTIONS: NOISE LEVEL

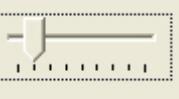
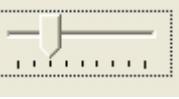
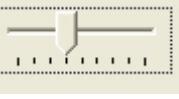
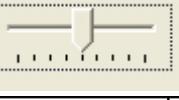
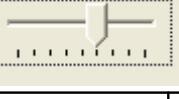
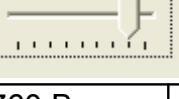
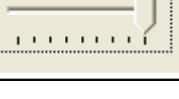
File mode:

- **Format:** raw binary file
- **Fixed size block:** Noise + Data = 960 bytes
- **Locked output size:** $((\text{size} + 256) / \text{Data}) * 960 \leq 256 \text{ Mb}$

Noise Level	Noise	Data	Min. Plain → Locked Size	Max. Plain → Locked Size
300%	720	240	1 B → 1920 B	64 Mb → 256 Mb
		Whitening 300%: 720 noise / 240 data	 	
400%	768	192	1 B → 1920 B	51 Mb → 256 Mb
		Whitening 400%: 768 noise / 192 data	 	
500%	800	160	1 B → 1920 B	42 Mb → 256 Mb
		Whitening 500%: 800 noise / 160 data	 	
900%	864	96	1 B → 2880 B	25 Mb → 256 Mb
		Whitening 900%: 864 noise / 96 data	 	
1100%	880	80	1 B → 3840 B	21 Mb → 256 Mb
		Whitening 1100%: 880 noise / 80 data	 	
1400%	896	64	1 B → 4800 B	17 Mb → 256 Mb
		Whitening 1400%: 896 noise / 64 data	 	
1900%	912	48	1 B → 5760 B	12 Mb → 256 Mb
		Whitening 1900%: 912 noise / 48 data	 	
2900%	928	32	1 B → 8640 B	8 Mb → 256 Mb
		Whitening 2900%: 928 noise / 32 data	 	
5900%	944	16	1 B → 16320 B	4 Mb → 256 Mb
		Whitening 5900%: 944 noise / 16 data	 	

Text mode:

- **Format:** text/email
- **Fixed size block:** Noise + Data = 960 bytes → 6 bit encoding → 1280 bytes
- **Locked output size:** ((size + 256) / Data) * 1280 ≤ 256 Kb

Noise Level	Noise	Data	Min. Plain → Locked Size	Max. Plain → Locked Size
300%	720	240	1 B → 2560 B	46 Kb → 256 Kb
		Whitening 300%: 720 noise / 240 data	  	
400%	768	192	1 B → 2560 B	36 Kb → 256 Kb
		Whitening 400%: 768 noise / 192 data	  	
500%	800	160	1 B → 2560 B	30 Kb → 256 Kb
		Whitening 500%: 800 noise / 160 data	  	
900%	864	96	1 B → 3840 B	18 Kb → 256 Kb
		Whitening 900%: 864 noise / 96 data	  	
1100%	880	80	1 B → 5120 B	15 Kb → 256 Kb
		Whitening 1100%: 880 noise / 80 data	  	
1400%	896	64	1 B → 6400 B	12 Kb → 256 Kb
		Whitening 1400%: 896 noise / 64 data	  	
1900%	912	48	1 B → 7680 B	9 Kb → 256 Kb
		Whitening 1900%: 912 noise / 48 data	  	
2900%	928	32	1 B → 11520 B	6 Kb → 256 Kb
		Whitening 2900%: 928 noise / 32 data	  	
5900%	944	16	1 B → 21760 B	3 Kb → 256 Kb
		Whitening 5900%: 944 noise / 16 data	  	

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EASY PASSWORDS SETUP



FILE/TEXT LOCK/UNLOCK – BASE SETUP (1 PASSWORD)

<p>Insert main passwords (Min: 8, Max: 32)</p> <p>(A) Cryptography <input type="text" value="xxxxxxxx"/> <input checked="" type="checkbox"/> Enable (B)</p> <p>(B) Cryptography <input type="text"/> <input type="checkbox"/> Enable (C)</p> <p>(C) Scrambling <input type="text"/> <input type="checkbox"/> Enable (D)</p> <p>Passwords Check A = B = C = D</p> <p>$H(X, Y) = \text{Hamming distance}(\text{Passw } X, \text{Passw } Y) \geq 25\%$</p> <p>(D) Whitening <input type="text"/> <input type="checkbox"/> Enable (D)</p>	<p>Insert decoy passwords (Min: 8, Max: 32)</p> <p><input type="checkbox"/> Decoy Enable!</p> <p>(A) Cryptography <input type="text"/> <input type="checkbox"/> Enable (B)</p> <p>(B) Cryptography <input type="text"/> <input checked="" type="checkbox"/> Enable (C)</p> <p>(C) Scrambling <input type="text"/> <input checked="" type="checkbox"/> Enable (D)</p> <p>Passwords Check Disabled</p> <p>$H(X, Y) = \text{Hamming distance}(\text{Passw } X, \text{Passw } Y) \geq 25\%$</p>
(I)	(II)

(I)	(<i>Cryptography A</i>)	First password
	(<i>Enable B</i>)	Second password enable/disable
	(<i>Enable C</i>)	Third password enable/disable
	(<i>Enable D</i>)	Forth password enable/disable
(II)	(<i>Decoy Enable!</i>)	Decoy enable/disable

- A) Disable decoy
- B.1) Disable all optional (Main_B / Main_C / Main_D) passwords
- B.2) Enter any (Main_A) password

Disabled (Main_B / Main_C / Main_D) passwords will be set same as (Main_A) password!

Constraints:

- 1) Length (Main_A) ≥ 8

Example:

A = B = C = D

Main: ok

Main_A = “any password”

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MEDIUM PASSWORDS SETUP



FILE/TEXT LOCK/UNLOCK – MEDIUM SETUP (4 PASSWORDS)

Insert main passwords (Min: 8, Max: 32)

(A) Cryptography	*****	<input checked="" type="checkbox"/> Enable (B)
(B) Cryptography	*****	<input checked="" type="checkbox"/> Enable (C)
(C) Scrambling	*****	<input checked="" type="checkbox"/> Enable (D)
Passwords Check	$H(A, B) H(A, C) H(B, C) = \{ 32\%, 38\%, 43\% \}$	
H(X, Y) = Hamming distance(Passw X, Passw Y) >= 25%		
(D) Whitening	*****	<input checked="" type="checkbox"/> Enable (D)

Insert decoy passwords (Min: 8, Max: 32)

<input type="checkbox"/> Decoy Enable	
(A) Cryptography	<input type="text"/>
(B) Cryptography	<input type="text"/>
(C) Scrambling	<input type="text"/>
Passwords Check	Disabled
H(X, Y) = Hamming distance(Passw X, Passw Y) >= 25%	

(I) (II)

(I)	<i>(Cryptography A)</i>	First password
	<i>(Cryptography B)</i>	Second password (cryptography CSPRNG)
	<i>(Scrambling C)</i>	Third password (scrambling CSPRNG)
	<i>(Whitening D)</i>	Forth password (whitening CSPRNG)
	<i>(Enable B)</i>	Second password enable/disable
	<i>(Enable C)</i>	Third password enable/disable
	<i>(Enable D)</i>	Forth password enable/disable
(II)	<i>(Decoy Enable!)</i>	Decoy enable/disable

A) Disable decoy

- B.1) Enable all or only some of (Main_B / Main_C / Main_D) optional passwords
 - B.2) Enter different (Main_A / Main_B / Main_C) passwords
 - B.3) Enter any (Main_D) password

Disabled (Main_B / Main_C / Main_D) passwords will be set same as (Main_A) password!

Constraints:

- | | | |
|------|----------------------------|--|
| 1.1) | | Length (Main_A) ≥ 8 |
| 1.2) | Enabled? (Main_B) | → Length (Main_B) ≥ 8 |
| 1.3) | Enabled? (Main_C) | → Length (Main_C) ≥ 8 |
| 1.4) | Enabled? (Main_D) | → Length (Main_D) ≥ 8 |
| 2.1) | Enabled? (Main_B) | → HAMMING DISTANCE (Main_A / Main_B) ≥ 25% |
| 2.2) | Enabled? (Main_C) | → HAMMING DISTANCE (Main_A / Main_C) ≥ 25% |
| 2.3) | Enabled? (Main_B / Main_C) | → HAMMING DISTANCE (Main_B / Main_C) ≥ 25% |

Example:

H(A, B) H(A, C) H(B, C) = { 2%, 38%, 38% }

Main: Main_A too similar to Main_B

Main_A = “**some_crypt_a**”
Main_B = “**some_crypt_b**”
Main_C = “scramble_c”
Main_D = “whiten_d”

H(A, B) H(A, C) H(B, C) = { 32%, 1%, 33% }

Main: Main_A too similar to Main_C

Main_A = “**some_crypt_a**”
Main_B = “another_crypt_b”
Main_C = “**some_crypt_c**”
Main_D = “whiten_d”

H(A, B) H(A, C) H(B, C) = { 32%, 33%, 0% }

Main: Main_B too similar to Main_C

Main_A = “some_crypt_a”
Main_B = “**another_crypt_b**”
Main_C = “**another_crypt_c**”
Main_D = “whiten_d”

H(A, B) H(A, C) H(B, C) = { 32%, 38%, 43% }

Main: ok

Main_A = “some_crypt_a”
Main_B = “another_crypt_b”
Main_C = “scramble_c”
Main_D = “whiten_d”

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ADVANCED PASSWORDS SETUP – LOCK



FILE/TEXT LOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

Insert main passwords (Min: 8, Max: 32)	
(A) Cryptography	***** <input type="text"/>
(B) Cryptography	***** <input type="text"/>
(C) Scrambling	***** <input type="text"/>
Passwords Check H(A, B) H(A, C) H(B, C) = { 32%, 38%, 43% } H(X, Y) = Hamming distance(Passw X, Passw Y) >= 25%	
(D) Whitening	***** <input type="text"/>
<input checked="" type="checkbox"/> Enable (D)	
Insert decoy passwords (Min: 8, Max: 32)	
<input checked="" type="checkbox"/> Decoy Enable!	
(A) Cryptography	***** <input type="text"/>
(B) Cryptography	***** <input type="text"/>
(C) Scrambling	***** <input type="text"/>
Passwords Check H(A, B) H(A, C) H(B, C) = { 35%, 39%, 34% } H(X, Y) = Hamming distance(Passw X, Passw Y) >= 25%	
<input checked="" type="checkbox"/> Enable (B)	
<input checked="" type="checkbox"/> Enable (C)	
<input checked="" type="checkbox"/> Enable (D)	

(I)	(<i>Cryptography A</i>)	First password
	(<i>Cryptography B</i>)	Second password (cryptography CSPRNG)
	(<i>Scrambling C</i>)	Third password (scrambling CSPRNG)
	(<i>Whitening D</i>)	Forth password (whitening CSPRNG)
	(<i>Enable B</i>)	Second password enable/disable
	(<i>Enable C</i>)	Third password enable/disable
	(<i>Enable D</i>)	Forth password enable/disable
(II)	(<i>Decoy Enable!</i>)	Decoy enable/disable
	(<i>Cryptography A</i>)	First decoy password
	(<i>Cryptography B</i>)	Second decoy password
	(<i>Scrambling C</i>)	Third decoy password
	(<i>Enable B</i>)	Second decoy password enable/disable
	(<i>Enable C</i>)	Third decoy password enable/disable

A) Disable decoy

- B.1) Enable all or only some of (Main_B / Main_C / Main_D) passwords
 - B.2) Enter different (Main_A / Main_B / Main_C) passwords
 - B.3) Enter any (Main_D) password

Disabled (Main_B / Main_C / Main_D) passwords will be set same as (Main_A) password!

C) Enable decoy

- D.1) Enable both or only one of (Decoy_B / Decoy_C) passwords
 - D.2) Enter different (Decoy_A / Decoy_B / Decoy_C) passwords

Disabled (Decoy B / Decoy C) passwords will be set same as (Decoy A) password!

Constraints:

1.1)	Length (Main_A) ≥ 8
1.2) Enabled? (Main_B)	\rightarrow Length (Main_B) ≥ 8
1.3) Enabled? (Main_C)	\rightarrow Length (Main_C) ≥ 8
1.4) Enabled? (Main_D)	\rightarrow Length (Main_D) ≥ 8
2.1) Enabled? (Main_B)	\rightarrow HAMMING DISTANCE (Main_A / Main_B) $\geq 25\%$
2.2) Enabled? (Main_C)	\rightarrow HAMMING DISTANCE (Main_A / Main_C) $\geq 25\%$
2.3) Enabled? (Main_B / Main_C)	\rightarrow HAMMING DISTANCE (Main_B / Main_C) $\geq 25\%$
3.1)	Length (Decoy_A) ≥ 8
3.2) Enabled? (Decoy_B)	\rightarrow Length (Decoy_B) ≥ 8
3.3) Enabled? (Decoy_C)	\rightarrow Length (Decoy_C) ≥ 8
4.1) Enabled? (Decoy_B)	\rightarrow HAMMING DISTANCE (Decoy_A / Decoy_B) $\geq 25\%$
4.2) Enabled? (Decoy_C)	\rightarrow HAMMING DISTANCE (Decoy_A / Decoy_C) $\geq 25\%$
4.3) Enabled? (Decoy_B / Decoy_C)	\rightarrow HAMMING DISTANCE (Decoy_B / Decoy_C) $\geq 25\%$
5.1) Enabled? (Decoy_B)	\rightarrow Enabled? (Main_B) \rightarrow Main_B \neq Decoy_B
5.2) Enabled? (Decoy_B)	\rightarrow Disabled? (Main_B) \rightarrow Main_A \neq Decoy_B
5.3) Enabled? (Decoy_C)	\rightarrow Enabled? (Main_C) \rightarrow Main_C \neq Decoy_C
5.4) Enabled? (Decoy_C)	\rightarrow Disabled? (Main_C) \rightarrow Main_A \neq Decoy_C

Example:

$H(A, B)H(A, C)H(B, C) = \{32\%, 38\%, 43\%\}$	<i>Main: ok</i>
Password (A)(B)(C) same as Main Setup	<i>Decoy: Main_A = Decoy_A, ...</i>
Main_A = "some_crypt_a" Main_B = "another_crypt_b" Main_C = "scramble_c" Main_D = "whiten_d"	Decoy_A = " some_crypt_a " Decoy_B = " another_crypt_b " Decoy_C = " scramble_c "
$H(A, B)H(A, C)H(B, C) = \{32\%, 38\%, 43\%\}$	<i>Main: ok</i>
$H(A, B)H(A, C)H(B, C) = \{35\%, 39\%, 34\%\}$	<i>Decoy: Main_A = Decoy_A, ...</i>
Main_A = "some_crypt_a" Main_B = "another_crypt_b" Main_C = "scramble_c" Main_D = "whiten_d"	Decoy_A = "12345678" Decoy_B = "qwertyui" Decoy_C = "zxcvbnm,"

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ADVANCED PASSWORDS SETUP – UNLOCK



FILE/TEXT UNLOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

Insert main passwords (Min: 8, Max: 32)

(A) Cryptography	*****	<input checked="" type="checkbox"/> Enable (B)
(B) Cryptography	*****	<input checked="" type="checkbox"/> Enable (C)
(C) Scrambling	*****	
Passwords Check	$H(A, B) H(A, C) H(B, C) = \{ 32\%, 38\%, 43\% \}$	
H(X, Y) = Hamming distance(Passw X, Passw Y) >= 25%		
(D) Whitening	*****	<input checked="" type="checkbox"/> Enable (D)

(I)

Insert decoy passwords (Min: 8, Max: 32)

Decoy Enabled

(A) Cryptography		
(B) Cryptography		<input checked="" type="checkbox"/> Enable (B)
(C) Scrambling		<input checked="" type="checkbox"/> Enable (C)

Passwords Check Disabled

$H[X, Y] = \text{Hamming distance}(\text{PasswX}, \text{PasswY}) \geq 25\%$

(II)

(I)	<i>(Cryptography A)</i>	First password
	<i>(Cryptography B)</i>	Second password (cryptography CSPRNG)
	<i>(Scrambling C)</i>	Third password (scrambling CSPRNG)
	<i>(Whitening D)</i>	Forth password (whitening CSPRNG)
	<i>(Enable B)</i>	Second password enable/disable
	<i>(Enable C)</i>	Third password enable/disable
	<i>(Enable D)</i>	Forth password enable/disable
(II)	<i>(Decoy Enable!)</i>	Decoy enable/disable

Example:

OK Main D password is always shared by main and decoy data

Lock	
Main_A = "some_crypt_a" Main_B = DISABLED Main_C = "scramble_c" Main_D = "whiten_d"	Decoy_A = "12345678" Decoy_B = "qwertyui" Decoy_C = DISABLED
Secret data unlock	
Main_A = "some_crypt_a" Main_B = DISABLED Main_C = "scramble_c" Main_D = "whiten_d"	DISABLED
Decoy data unlock	
Main_A = "12345678" Main_B = "qwertyui" Main_C = DISABLED Main_D = "whiten_d"	DISABLED

OK Main_B / Main_C / Decoy_B / Decoy_C passwords can be independently disabled

Lock	
Main_A = "some_crypt_a" Main_B = DISABLED Main_C = "scramble_c" Main_D = DISABLED	Decoy_A = "12345678" Decoy_B = "qwertyui" Decoy_C = DISABLED
Secret data unlock	
Main_A = "some_crypt_a" Main_B = DISABLED Main_C = "scramble_c" Main_D = DISABLED	DISABLED
Decoy data unlock	
Main_A = "12345678" Main_B = "qwertyui" Main_C = DISABLED Main_D = "some_crypt_a"	DISABLED

This is a **WRONG** configuration:

- disabled Main_D password is set same as Main_A password
- decoy unlocking (when you're under attack...) will reveal Main_A password to the attacker!

Never disable Main_D password if you're planning to use a decoy.

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FILE LOCK – BASE SETUP (1 PASSWORD)

BEGIN:

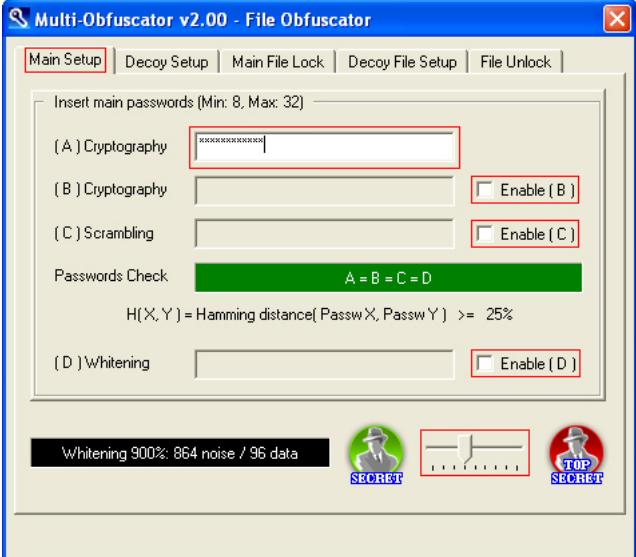


[\(File Lock/Unlock\)](#)

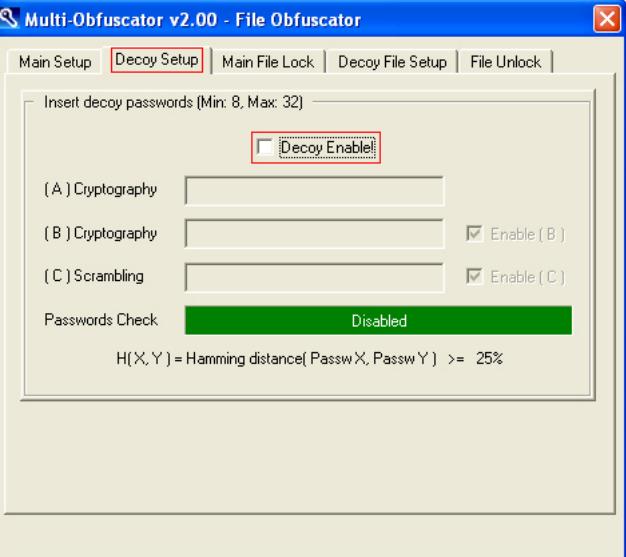
Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:



(I)



(II)

(I) <u>(Cryptography A)</u>	First password
<u>(Enable B)</u>	Second password enable/disable
<u>(Enable C)</u>	Third password enable/disable
<u>(Enable D)</u>	Forth password enable/disable
(II) <u>(Decoy Enable!)</u>	Decoy enable/disable

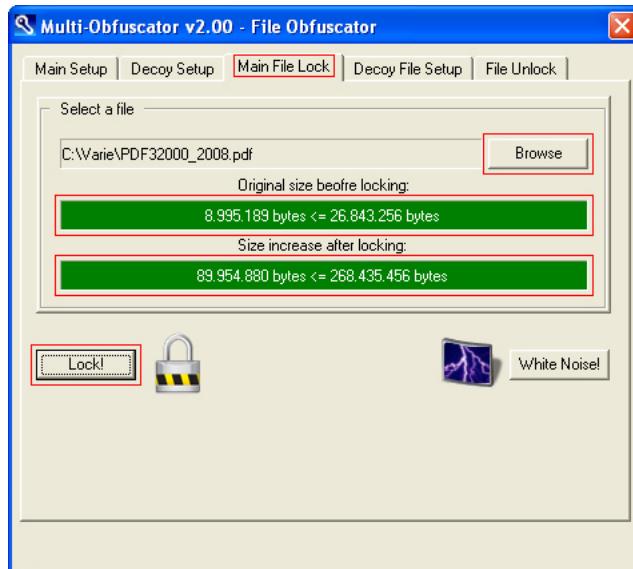
Insert a password and choose a noise level. Full password and noise details are available in special separate sections:

- [EASY PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

Base setup, even though looking like a traditional security software, relies on the same multi-layered security architecture as advanced setup.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(Browse)	Select a file
(Original size before locking)	Example: 8.995.189 bytes
(Size increase after locking)	Example: 89.954.880 bytes
(Lock!)	Start locking

Choose the secret data you want to lock (a single file or a zip/rar/... archive). Secret data will not be overwritten and locked data will be saved to a different folder. File/archive name will not be saved to the locked data, allowing renaming and unlocking secret data with a different name.

Example:

- MultiObfuscator: C:\...\dir1\xxx.pdf [9 Mb] → C:\...\dir2\xxx.pdf [90 Mb]
- Rename: C:\...\dir2\xxx.pdf → UsbKey:\...\yyy.pdf
- MultiObfuscator: UsbKey:\...\yyy.pdf [90 Mb] → D:\...\yyy.pdf [9 Mb]

There's a maximum locked size constraint of 256 Mb and, depending on the noise level, there's also a maximum plain size constraint. Little files (up to 4 Mb) will let you free to choose any noise level. Medium and large files (up to 64 Mb) will force you to choose a lower compatible (by size) noise level.

Example:

- Noise level: 900%
- Original size before locking: 8.995.189 bytes \leq 25 Mb
- Size after locking: $((8.995.189 + 256) / 96) * 960 = 89.954.880$ bytes \leq 256 Mb

Noise Level	Noise	Data	Min. Plain → Locked Size	Max. Plain → Locked Size
900%	864	96	1 B → 2880 B	25 Mb → 256 Mb

OPTIONS: NOISE LEVEL

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BEGIN:

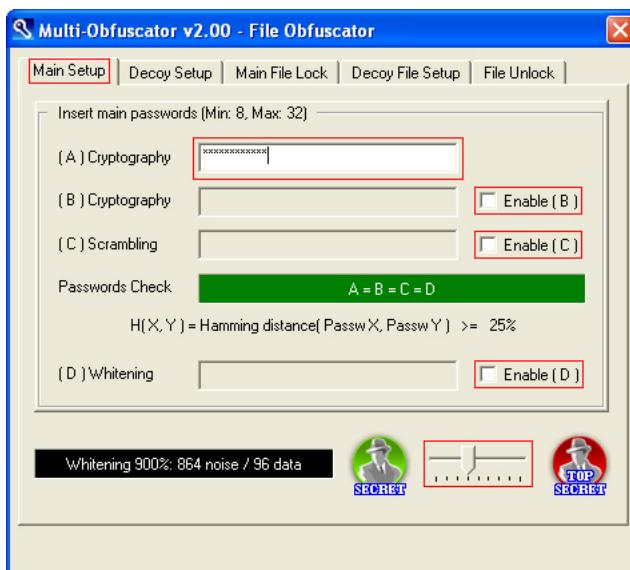


[*\(File Lock/Unlock\)*](#)

Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:

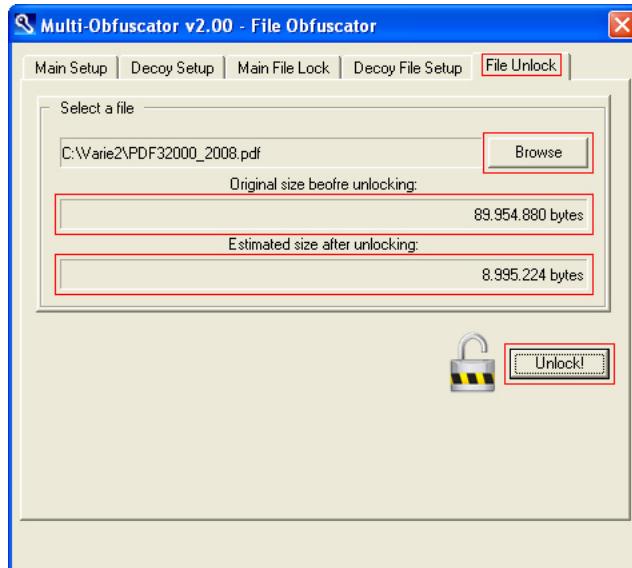


<i>(Cryptography A)</i>	First password
<i>(Enable B)</i>	Second password enable/disable
<i>(Enable C)</i>	Third password enable/disable
<i>(Enable D)</i>	Forth password enable/disable

Set same password and noise level as locking time. Full password and noise details are available in special separate sections:

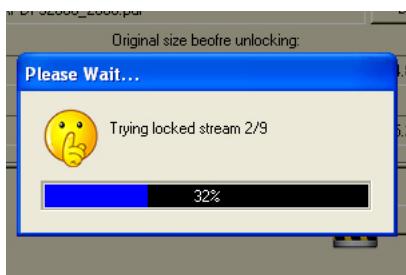
- [EASY PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

STEP 2:



(<i>Browse</i>)	Select a locked file
(<i>Original size before unlocking</i>)	Example: 89.954.880 bytes
(<i>Estimated size after unlocking</i>)	Example: 8.995.224 bytes
(<i>Unlock!</i>)	Start unlocking

Choose the locked data you want to unlock. Locked data will not be overwritten and unlocked secret data will be saved to a different folder.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked data are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

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FILE LOCK – MEDIUM SETUP (4 PASSWORDS)

BEGIN:



[\(File Lock/Unlock\)](#)

Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:

The screenshot shows two windows of the Multi-Obfuscator v2.00 software. Both windows have a title bar "Multi-Obfuscator v2.00 - File Obfuscator".
The left window (I) has the "Main Setup" tab selected. It contains fields for inserting main passwords (Min: 8, Max: 32) for four categories: (A) Cryptography, (B) Cryptography, (C) Scrambling, and (D) Whitening. Each category has a password input field with red borders and a "Enable" checkbox. Below these is a "Passwords Check" section with a green bar showing results: $H(A, B) H(A, C) H(B, C) = \{32\%, 38\%, 43\%\}$. A note below says $H(X, Y) = \text{Hamming distance}(\text{Passw X}, \text{Passw Y}) \geq 25\%$. At the bottom are icons for "Whitening 900%", "SECRET", and "TOP SECRET".
The right window (II) has the "Decoy Setup" tab selected. It contains fields for inserting decoy passwords (Min: 8, Max: 32) for the same four categories. The "Decoy Enable!" checkbox is checked and highlighted with a red border. Below these is a "Passwords Check" section with a green bar showing "Disabled". A note below says $H(X, Y) = \text{Hamming distance}(\text{Passw X}, \text{Passw Y}) \geq 25\%$.

(I) [\(Cryptography A\)](#)

First password

[\(Cryptography B\)](#)

Second password (cryptography CSPRNG)

[\(Scrambling C\)](#)

Third password (scrambling CSPRNG)

[\(Whitening D\)](#)

Forth password (whitening CSPRNG)

[\(Enable B\)](#)

Second password enable/disable

[\(Enable C\)](#)

Third password enable/disable

[\(Enable D\)](#)

Forth password enable/disable

(II) [\(Decoy Enable!\)](#)

Decoy enable/disable

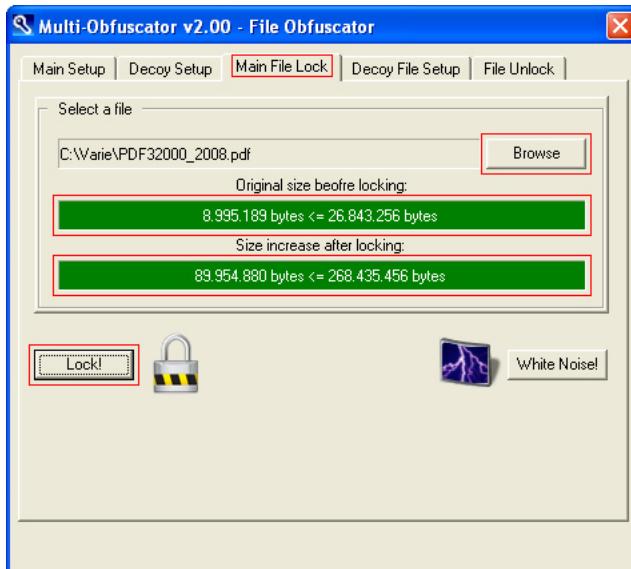
Insert a set of passwords and choose a noise level. Full password and noise details are available in special separate sections:

- [MEDIUM PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

Medium setup allows full usage of the multi-layered security architecture.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(Browse)	Select a file
(Original size before locking)	Example: 8.995.189 bytes
(Size increase after locking)	Example: 89.954.880 bytes
(Lock!)	Start locking

Choose the secret data you want to lock (a single file or a zip/rar/... archive). Secret data will not be overwritten and locked data will be saved to a different folder. File/archive name will not be saved to the locked data, allowing renaming and unlocking secret data with a different name.

Example:

- MultiObfuscator: C:\..\dir1\xxx.pdf [9 Mb] → C:\..\dir2\xxx.pdf [90 Mb]
- Rename: C:\..\dir2\xxx.pdf → UsbKey:\...\yyy.pdf
- MultiObfuscator: UsbKey:\...\yyy.pdf [90 Mb] → D:\...\yyy.pdf [9 Mb]

There's a maximum locked size constraint of 256 Mb and, depending on the noise level, there's also a maximum plain size constraint. Little files (up to 4 Mb) will let you free to choose any noise level. Medium and large files (up to 64 Mb) will force you to choose a lower compatible (by size) noise level.

Example:

- Noise level: 900%
- Original size before locking: 8.995.189 bytes \leq 25 Mb
- Size after locking: $((8.995.189 + 256) / 96) * 960 = 89.954.880$ bytes \leq 256 Mb

Noise Level	Noise	Data	Min. Plain → Locked Size	Max. Plain → Locked Size
900%	864	96	1 B → 2880 B	25 Mb → 256 Mb

OPTIONS: NOISE LEVEL

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FILE UNLOCK – MEDIUM SETUP (4 PASSWORDS)

BEGIN:

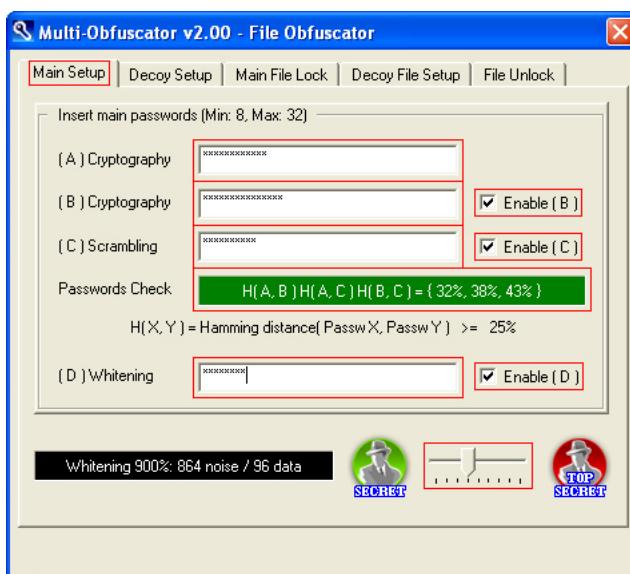


[\(File Lock/Unlock\)](#)

Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:

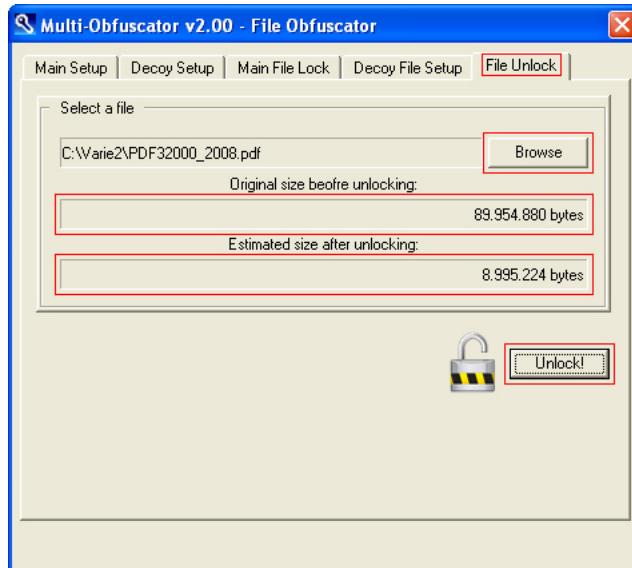


(Cryptography A)	First password
(Cryptography B)	Second password (cryptography CSPRNG)
(Scrambling C)	Third password (scrambling CSPRNG)
(Whitening D)	Forth password (whitening CSPRNG)
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable

Set same set of passwords and noise level as locking time. Full password and noise details are available in special separate sections:

- [MEDIUM PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

STEP 2:



(<i>Browse</i>)	Select a locked file
(<i>Original size before unlocking</i>)	Example: 89.954.880 bytes
(<i>Estimated size after unlocking</i>)	Example: 8.995.224 bytes
(<i>Unlock!</i>)	Start unlocking

Choose the locked data you want to unlock. Locked data will not be overwritten and unlocked secret data will be saved to a different folder.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked data are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

[FEATURES: PROGRAM ARCHITECTURE](#)

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FILE LOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

BEGIN:

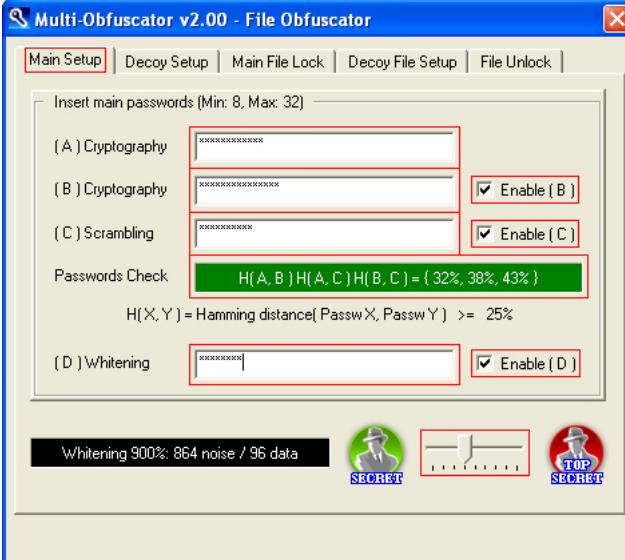


[\(File Lock/Unlock\)](#)

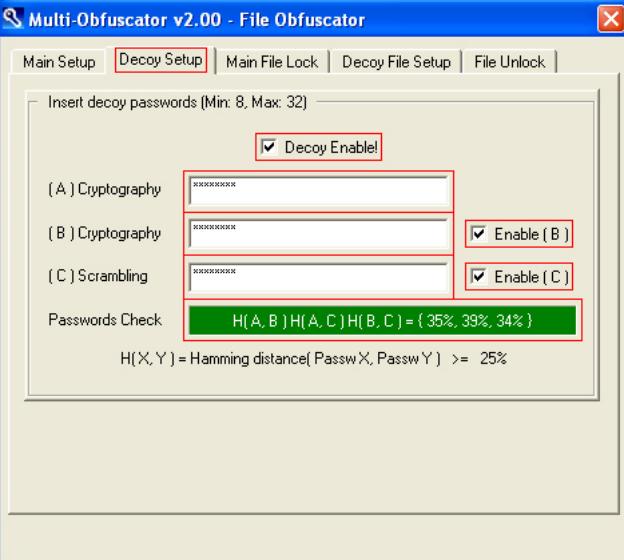
Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:



(I)



(II)

(I)	(Cryptography A)	First password
	(Cryptography B)	Second password (cryptography CSPRNG)
	(Scrambling C)	Third password (scrambling CSPRNG)
	(Whitening D)	Forth password (whitening CSPRNG)
	(Enable B)	Second password enable/disable
	(Enable C)	Third password enable/disable
	(Enable D)	Forth password enable/disable
(II)	(Decoy Enable!)	Decoy enable/disable
	(Cryptography A)	First decoy password
	(Cryptography B)	Second decoy password
	(Scrambling C)	Third decoy password
	(Enable B)	Second decoy password enable/disable
	(Enable C)	Third decoy password enable/disable

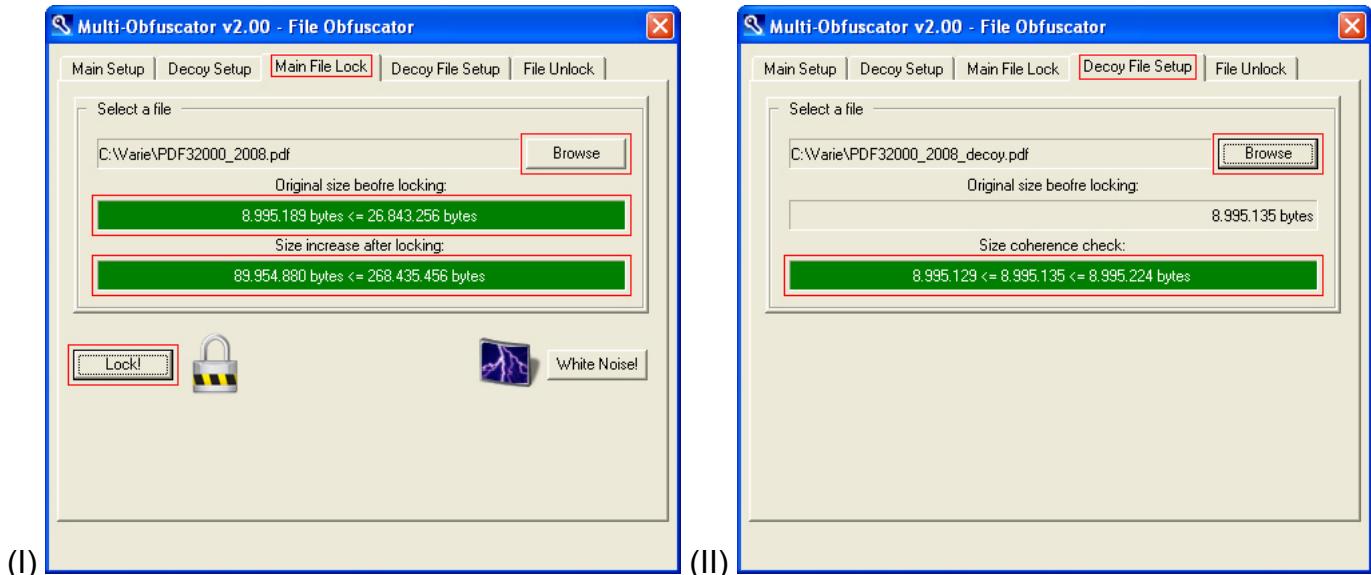
Insert a set of passwords, a set of decoy passwords and choose a noise level. Full password and noise details are available in special separate sections:

- [ADVANCED PASSWORDS SETUP – LOCK](#)
- [OPTIONS: NOISE LEVEL](#)

Advanced setup allows full usage of the multi-layered and multi-aspect security architecture.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(I)	(<i>Browse</i>)	Select a file
	(<i>Original size before locking</i>)	Example: 8.995.189 bytes
	(<i>Size increase after locking</i>)	Example: 89.954.880 bytes
	(<i>Lock!</i>)	Start locking
(II)	(<i>Browse</i>)	Select a decoy file
	(<i>Size coherence check</i>)	Example: 8.995.135 bytes

Choose the secret data and a compatible (by size) decoy data you want to lock (a single file or a zip/rar/... archive).

Example:

- Noise level: 900%
- Original size before locking: 8.995.189 bytes \leq 25 Mb
- Size after locking: $((8.995.189 + 256) / 96) * 960 = 89.954.880$ bytes \leq 256 Mb
- Decoy size: $((8.995.129 \leq x \leq 8.995.224) + 256) / 96 * 960 = 89.954.880$ bytes \leq 256 Mb

Noise Level	Noise	Data	Min. Plain \rightarrow Locked Size	Max. Plain \rightarrow Locked Size
900%	864	96	1 B \rightarrow 2880 B	25 Mb \rightarrow 256 Mb

Be aware that:

- the higher the noise level is, the less the data bytes per block are
- the less the data bytes per block are, the narrower the decoy size range is

$$\begin{array}{lllll} \text{Minimum (300\%)} & \rightarrow & \text{Data} = 240 & \rightarrow & \inf \leq x \leq \sup \rightarrow \sup - \inf + 1 = 240 \text{ bytes} \\ \text{Maximum (5900\%)} & \rightarrow & \text{Data} = 16 & \rightarrow & \inf \leq x \leq \sup \rightarrow \sup - \inf + 1 = 16 \text{ bytes} \end{array}$$

Be sure to read also the intermediate section

FILE LOCK – MEDIUM SETUP (4 PASSWORDS)

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FILE UNLOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

BEGIN:

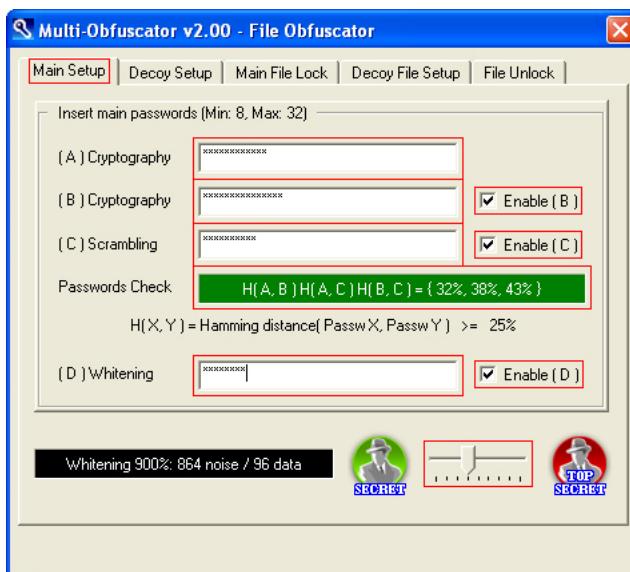


[\(File Lock/Unlock\)](#)

Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:



(Cryptography A)	First password
(Cryptography B)	Second password (cryptography CSPRNG)
(Scrambling C)	Third password (scrambling CSPRNG)
(Whitening D)	Forth password (whitening CSPRNG)
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable

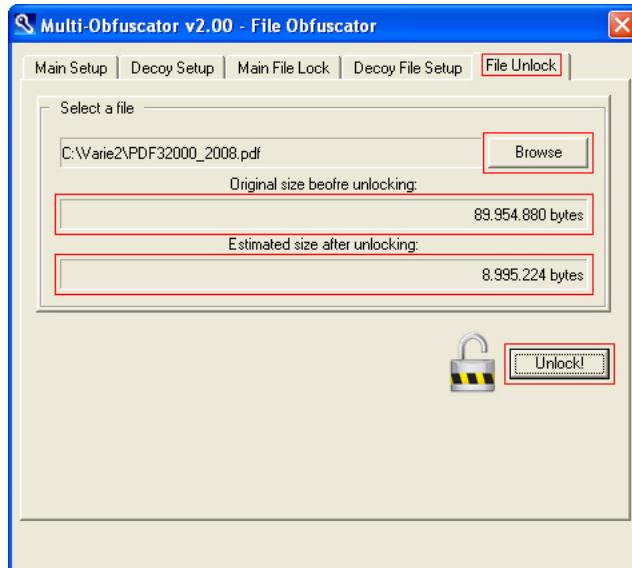
Set same set of passwords (secret to get secret data, decoy to get decoy data) and noise level as locking time. Full password and noise details are available in special separate sections:

- [ADVANCED PASSWORDS SETUP – UNLOCK](#)
- [OPTIONS: NOISE LEVEL](#)

Detailed decoy details are available here:

[WHAT IS DENIABLE CRYPTOGRAPHY?](#)

STEP 2:



(<i>Browse</i>)	Select a locked file
(<i>Original size before unlocking</i>)	Example: 89.954.880 bytes
(<i>Estimated size after unlocking</i>)	Example: 8.995.224 bytes
(<i>Unlock!</i>)	Start unlocking

Choose the locked data you want to unlock. Locked data will not be overwritten and unlocked data (secret or decoy, depending on the set of passwords) will be saved to a different folder.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked data are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

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WHITE NOISE AS A DECOY (FILE)

BEGIN:

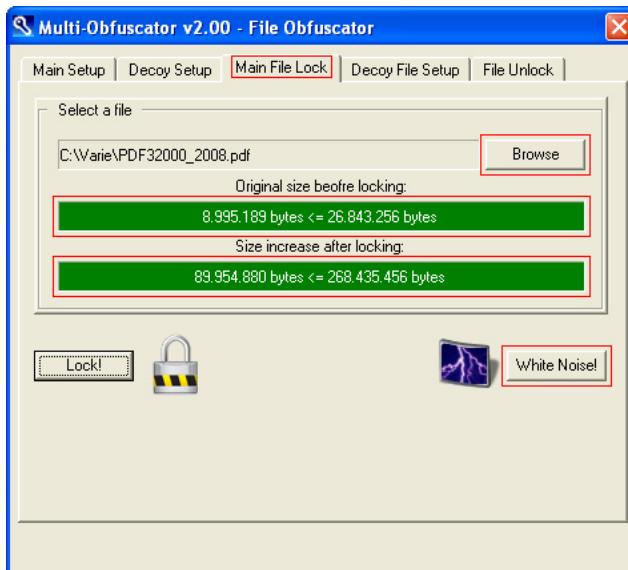


[\(File Lock/Unlock\)](#)

Go to file (binary raw format) panel

Select *File Lock/Unlock*.

STEP 1:



(Browse)	Select a file
(Original size before locking)	Example: 8.995.189 bytes
(Size increase after locking)	Example: 89.954.880 bytes
(White Noise!)	Start randomizing

Locked files are statistically undistinguishable from void randomized files. Advanced users will be able to add void/fake containers to the sensitive ones, in order to waste attackers' time. This task will save white noise only to a fake container compatible (by size) with the selected file.

[FEATURES: PROGRAM ARCHITECTURE](#)

Example:

- Noise level: 900%
- Size after locking: $((8.995.189 + 256) / 96) * 960 = \mathbf{89.954.880}$ bytes \leq 256 Mb
- White noise size: **89.954.880** bytes

Noise Level	Noise	Data	Min. Plain \rightarrow Locked Size	Max. Plain \rightarrow Locked Size
900%	864	96	1 B \rightarrow 2880 B	25 Mb \rightarrow 256 Mb

[OPTIONS: NOISE LEVEL](#)

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TEXT LOCK – BASE SETUP (1 PASSWORD)

BEGIN:

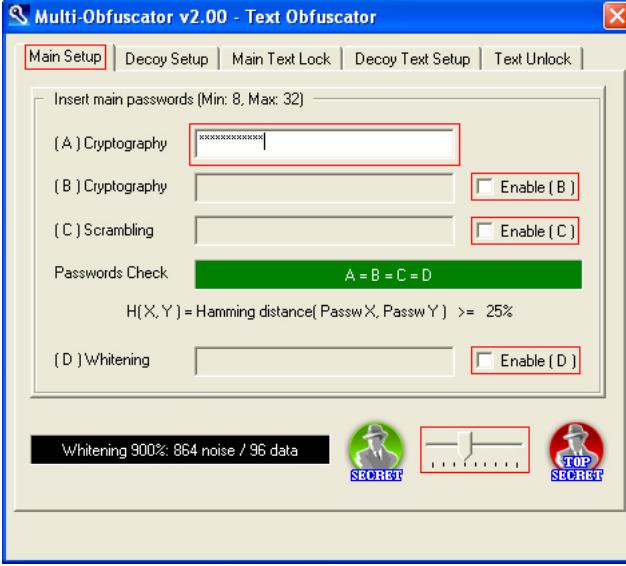


[\(Text Lock/Unlock\)](#)

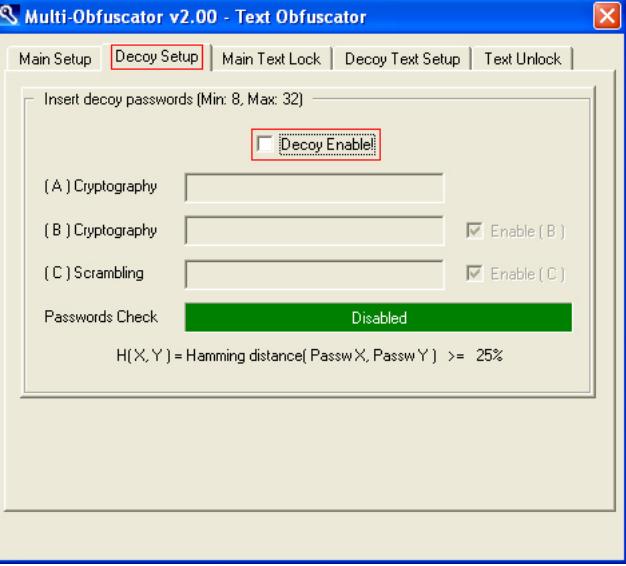
Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:



(I)



(II)

(I) (Cryptography A)	First password
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable
(II) (Decoy Enable!)	Decoy enable/disable

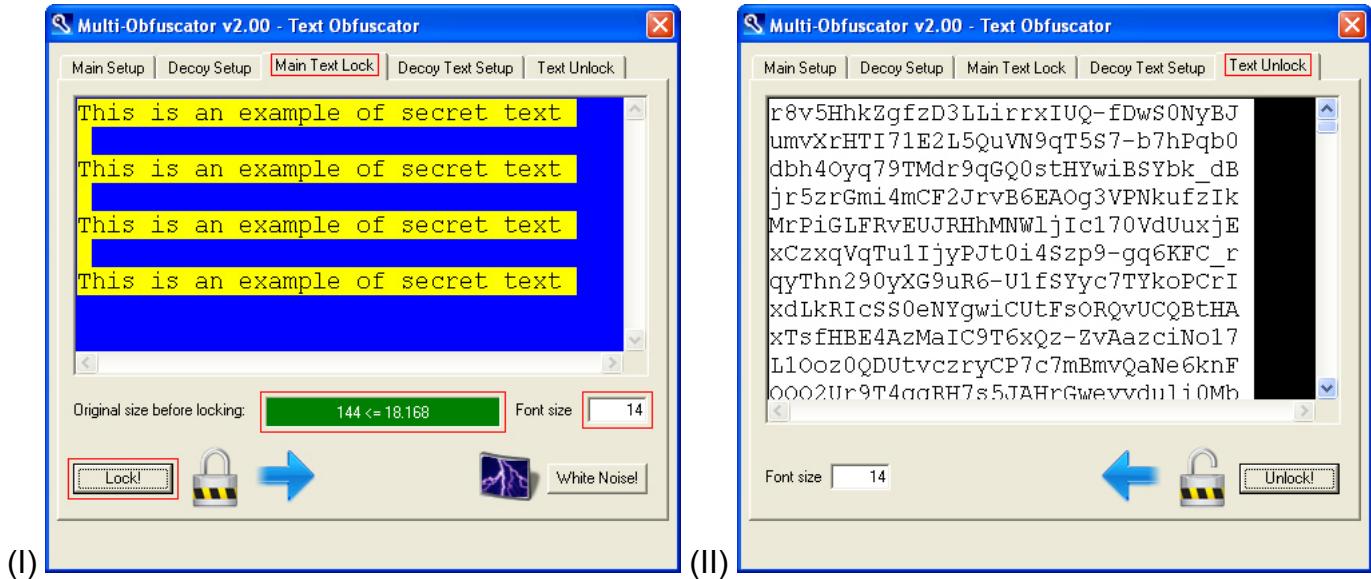
Insert a password and choose a noise level. Full password and noise details are available in special separate sections:

- [EASY PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

Base setup, even though looking like a traditional security software, relies on the same multi-layered security architecture as advanced setup.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(I)	<TextEdit – blue window >	Enter/paste a text
	(Original size before locking)	Example: 144 bytes
	(Font size)	Text font size
	(Lock!)	Start locking

Choose the secret text you want to lock. Secret text will not be overwritten and locked text will be saved to the *Text Unlock* window, ready to be cut and pasted.

There's a maximum locked size constraint of 256 Kb that, depending on the noise level, will also add a maximum plain size constraint. Little files (up to 3 Kb) will let you free to choose any noise level. Medium and large files (up to 46 Kb) will force you to choose a lower compatible (by size) noise level.

Example:

- Noise level: 900%
- Original size before locking: 144 bytes \leq 18 Kb
- Size after locking: $((144 + 256) / 96) * 1280 = 6.400$ bytes \leq 256 Kb

Noise Level	Noise	Data	Min. Plain \rightarrow Locked Size	Max. Plain \rightarrow Locked Size
900%	864	96	1 B \rightarrow 3840 B	18 Kb \rightarrow 256 Kb

OPTIONS: NOISE LEVEL

[BACK](#)



TEXT UNLOCK – BASE SETUP (1 PASSWORD)

BEGIN:

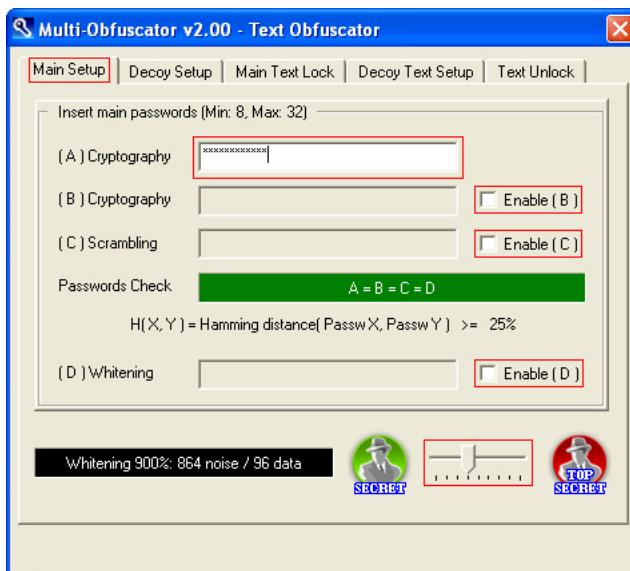


[\(Text Lock/Unlock\)](#)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:

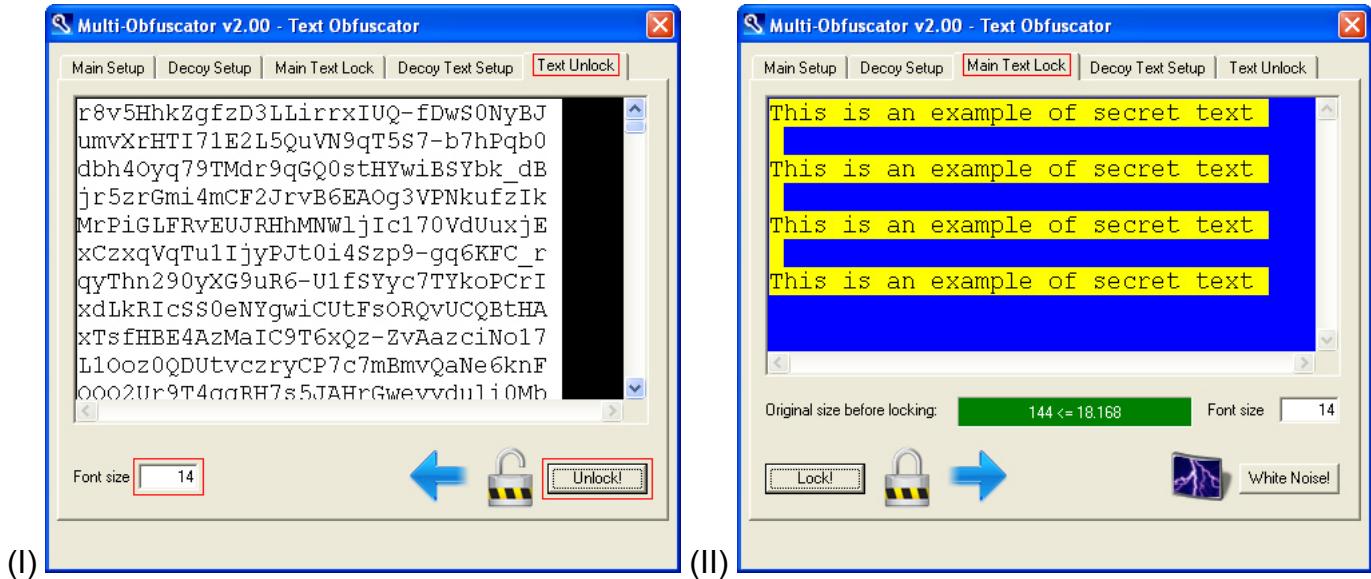


(Cryptography A)	First password
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable

Set same password and noise level as locking time. Full password and noise details are available in special separate sections:

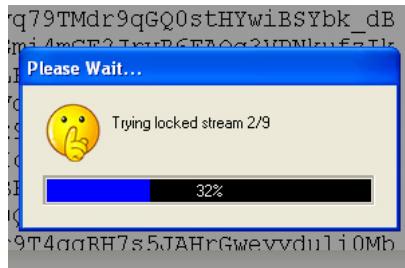
- [EASY PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

STEP 2:



(I)	<TextEdit – black window >	Enter/paste a locked text
	(Font size)	Text font size
	(Unlock!)	Start unlocking

Choose the locked text you want to unlock. Locked text will not be overwritten and unlocked secret text will be saved to the *Main Text Lock* window, ready to be cut and pasted.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked text are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

[FEATURES: PROGRAM ARCHITECTURE](#)

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TEXT LOCK – MEDIUM SETUP (4 PASSWORDS)

BEGIN:



(Text Lock/Unlock)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:

(I)

(A) Cryptography	xxxxxxxxxx
(B) Cryptography	xxxxxxxxxxxx
(C) Scrambling	xxxxxxxxxx
Whitening	xxxxxx
Passwords Check $H(X, Y) = \text{Hamming distance}(Passw X, Passw Y) \geq 25\%$	
(D) Whitening	
Whitening 900%: 864 noise / 96 data	

(II)

Main Setup	Decoy Setup	Main Text Lock	Decoy Text Setup	Text Unlock
Insert main passwords (Min: 8, Max: 32)				
(A) Cryptography				
(B) Cryptography				
(C) Scrambling				
Passwords Check				
$H(X, Y) = \text{Hamming distance}(Passw X, Passw Y) \geq 25\%$				
(D) Whitening				
Decoy Enable!				
Decoy Check				
Decoy 900%: 864 noise / 96 data				

(I)	(<i>Cryptography A</i>)	First password
	(<i>Cryptography B</i>)	Second password (cryptography CSPRNG)
	(<i>Scrambling C</i>)	Third password (scrambling CSPRNG)
	(<i>Whitening D</i>)	Forth password (whitening CSPRNG)
	(<i>Enable B</i>)	Second password enable/disable
	(<i>Enable C</i>)	Third password enable/disable
	(<i>Enable D</i>)	Forth password enable/disable
(II)	(<i>Decoy Enable!</i>)	Decoy enable/disable

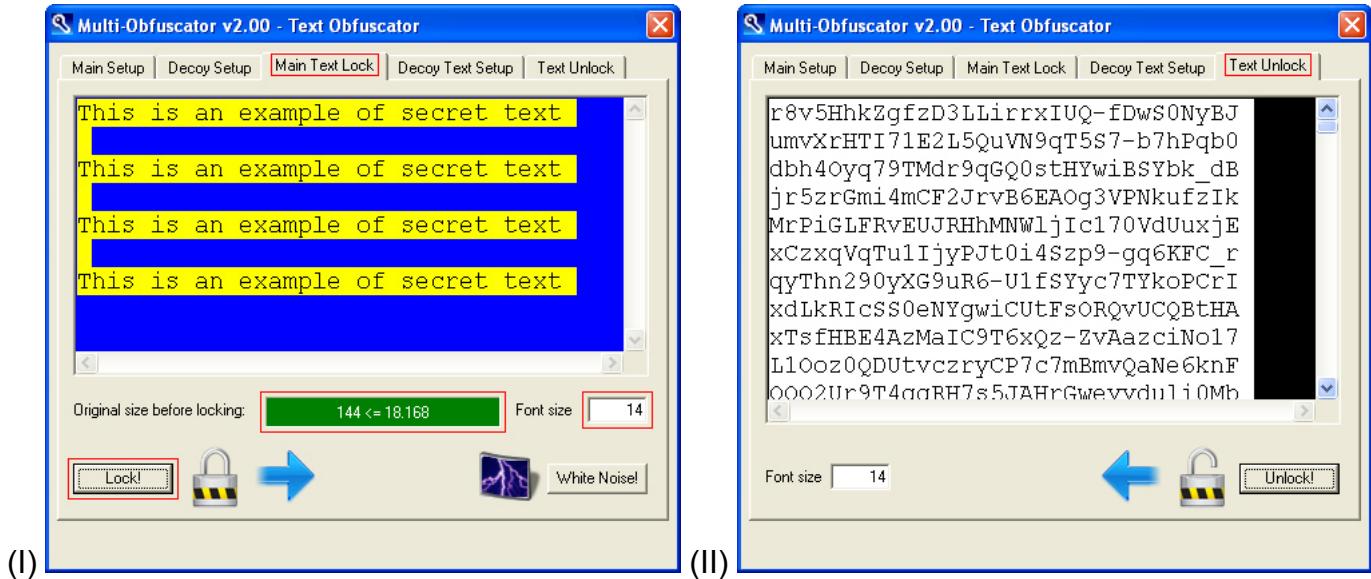
Insert a set of passwords and choose a noise level. Full password and noise details are available in special separate sections:

- [MEDIUM PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

Medium setup allows full usage of the multi-layered security architecture.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(I)	<TextEdit – blue window >	Enter/paste a text
	(Original size before locking)	Example: 144 bytes
	(Font size)	Text font size
	(Lock!)	Start locking

Choose the secret text you want to lock. Secret text will not be overwritten and locked text will be saved to the *Text Unlock* window, ready to be cut and pasted.

There's a maximum locked size constraint of 256 Kb that, depending on the noise level, will also add a maximum plain size constraint. Little files (up to 3 Kb) will let you free to choose any noise level. Medium and large files (up to 46 Kb) will force you to choose a lower compatible (by size) noise level.

Example:

- Noise level: 900%
- Original size before locking: 144 bytes \leq 18 Kb
- Size after locking: $((144 + 256) / 96) * 1280 = 6.400$ bytes \leq 256 Kb

Noise Level	Noise	Data	Min. Plain \rightarrow Locked Size	Max. Plain \rightarrow Locked Size
900%	864	96	1 B \rightarrow 3840 B	18 Kb \rightarrow 256 Kb

[OPTIONS: NOISE LEVEL](#)

[BACK](#)



TEXT UNLOCK – MEDIUM SETUP (4 PASSWORDS)

BEGIN:

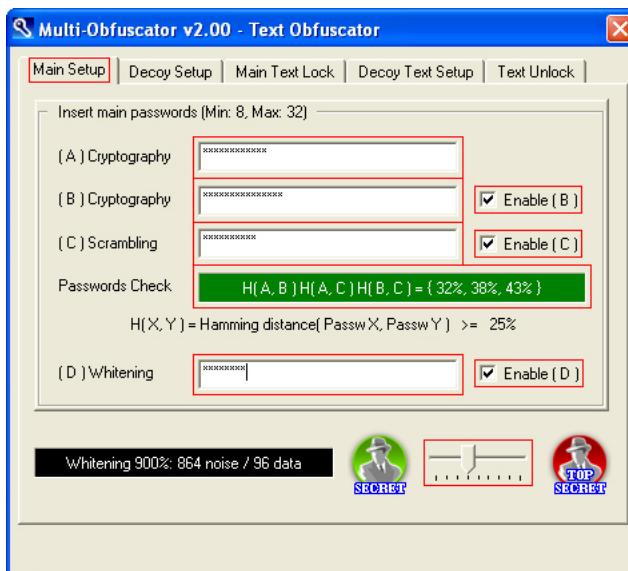


[\(Text Lock/Unlock\)](#)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:

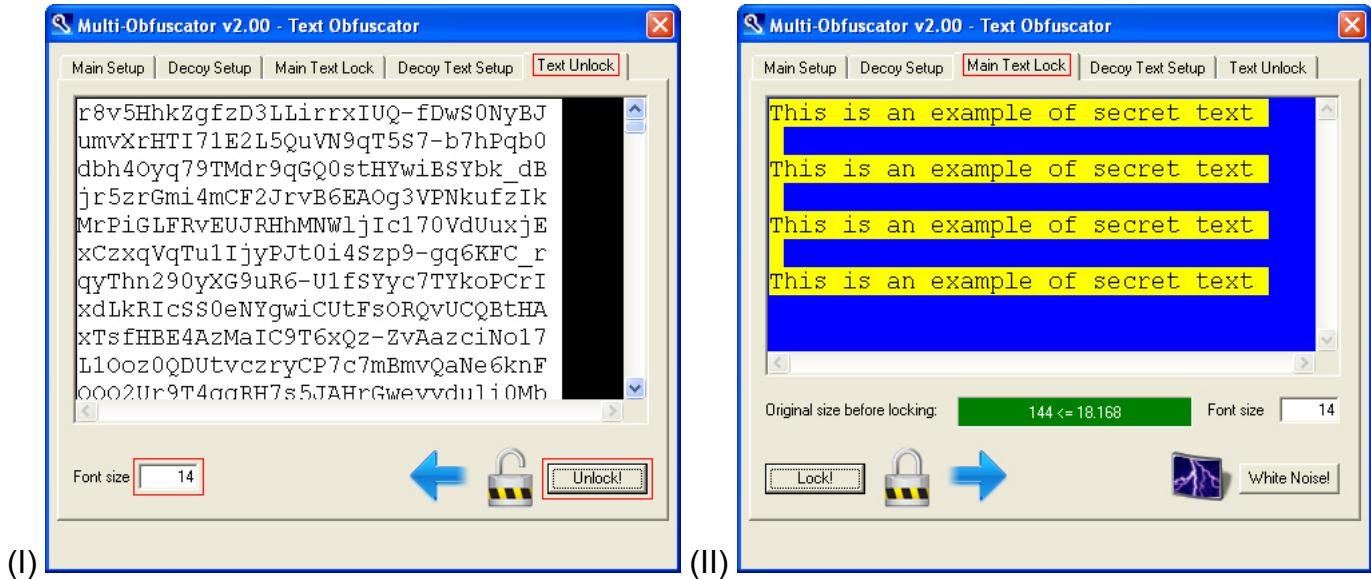


(Cryptography A)	First password
(Cryptography B)	Second password (cryptography CSPRNG)
(Scrambling C)	Third password (scrambling CSPRNG)
(Whitening D)	Forth password (whitening CSPRNG)
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable

Set same set of passwords and noise level as locking time. Full password and noise details are available in special separate sections:

- [MEDIUM PASSWORDS SETUP](#)
- [OPTIONS: NOISE LEVEL](#)

STEP 2:



(I) <TextEdit – black window >	Enter/paste a locked text
(Font size)	Text font size
(Unlock!)	Start unlocking

Choose the locked text you want to unlock. Locked text will not be overwritten and unlocked secret text will be saved to the *Main Text Lock* window, ready to be cut and pasted.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked text are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

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TEXT LOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

BEGIN:



[\(Text Lock/Unlock\)](#)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:

(I)

Main Setup

Insert main passwords (Min: 8, Max: 32)

(A) Cryptography: Enable (A)

(B) Cryptography: Enable (B)

(C) Scrambling: Enable (C)

Passwords Check: $H(A, B) H(A, C) H(B, C) = \{ 32\%, 38\%, 43\% \}$

$H(X, Y) = \text{Hamming distance}(\text{Passw X}, \text{Passw Y}) \geq 25\%$

(D) Whitening: Enable (D)

Whitening 900%: 864 noise / 96 data

(II)

Decoy Setup

Insert decoy passwords (Min: 8, Max: 32)

Decoy Enable!

(A) Cryptography: Enable (A)

(B) Cryptography: Enable (B)

(C) Scrambling: Enable (C)

Passwords Check: $H(A, B) H(A, C) H(B, C) = \{ 35\%, 39\%, 34\% \}$

$H(X, Y) = \text{Hamming distance}(\text{Passw X}, \text{Passw Y}) \geq 25\%$

(I)	(Cryptography A)	First password
	(Cryptography B)	Second password (cryptography CSPRNG)
	(Scrambling C)	Third password (scrambling CSPRNG)
	(Whitening D)	Forth password (whitening CSPRNG)
	(Enable B)	Second password enable/disable
	(Enable C)	Third password enable/disable
	(Enable D)	Forth password enable/disable
(II)	(Decoy Enable!)	Decoy enable/disable
	(Cryptography A)	First decoy password
	(Cryptography B)	Second decoy password
	(Scrambling C)	Third decoy password
	(Enable B)	Second decoy password enable/disable
	(Enable C)	Third decoy password enable/disable

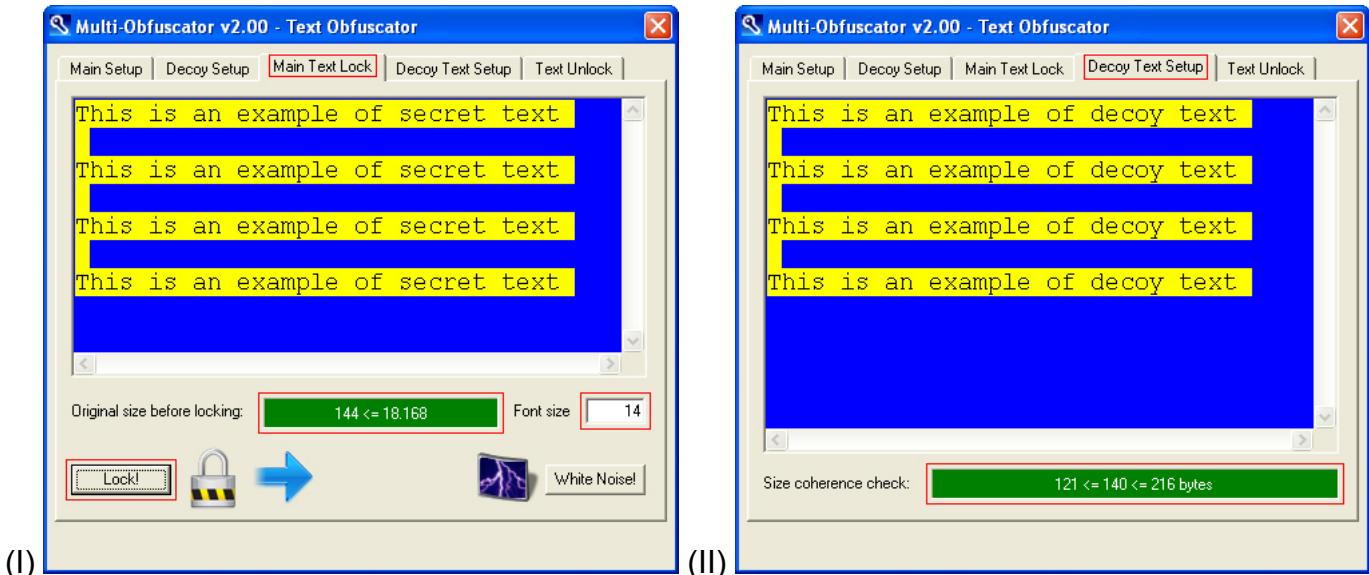
Insert a set of passwords, a set of decoy passwords and choose a noise level. Full password and noise details are available in special separate sections:

- [ADVANCED PASSWORDS SETUP – LOCK](#)
- [OPTIONS: NOISE LEVEL](#)

Advanced setup allows full usage of the multi-layered and multi-aspect security architecture.

[FEATURES: PROGRAM ARCHITECTURE](#)

STEP 2:



(I)	<TextEdit – blue window>	Enter/paste a text
	(Original size before locking)	Example: 144 bytes
	(Font size)	Text font size
	(Lock!)	Start locking
(II)	<TextEdit – blue window>	Enter/paste a decoy text
	(Size coherence check)	Example: 140 bytes

Choose the secret text and a compatible (by size) decoy text you want to lock.

Example:

- Noise level: 900%
- Original size before locking: 144 bytes \leq 18 Kb
- Size after locking: $((144 + 256) / 96) * 1280 = 6.400$ bytes \leq 256 Kb
- Decoy size: $((121 \leq x \leq 216) + 256) / 96 * 1280 = 6.400$ bytes \leq 256 Kb

Noise Level	Noise	Data	Min. Plain \rightarrow Locked Size	Max. Plain \rightarrow Locked Size
900%	864	96	1 B \rightarrow 3840 B	18 Kb \rightarrow 256 Kb

Be aware that:

- the higher the noise level is, the less the data bytes per block are
- the less the data bytes per block are, the narrower the decoy size range is

Minimum (300%) \rightarrow Data = 240 \rightarrow inf \leq x \leq sup \rightarrow sup - inf = 240 bytes

Maximum (5900%) \rightarrow Data = 16 \rightarrow inf \leq x \leq sup \rightarrow sup - inf = 16 bytes

Be sure to read also the intermediate section

[TEXT LOCK – MEDIUM SETUP \(4 PASSWORDS\)](#)

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TEXT UNLOCK – ADVANCED SETUP (4 PASSWORDS+DECOY)

BEGIN:

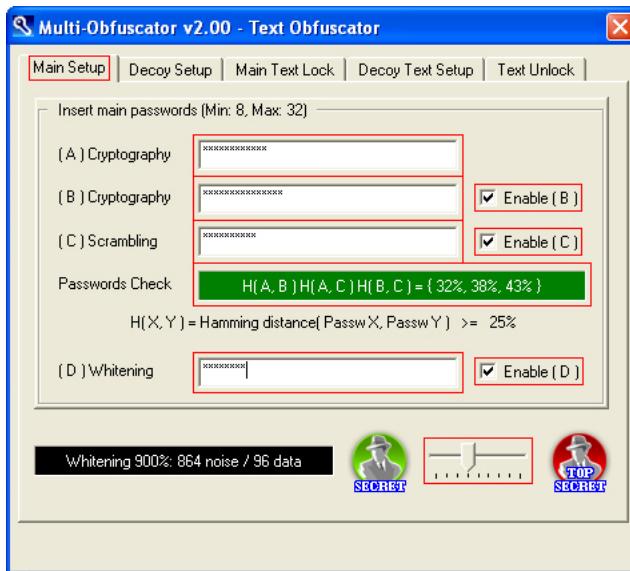


[\(Text Lock/Unlock\)](#)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:



(Cryptography A)	First password
(Cryptography B)	Second password (cryptography CSPRNG)
(Scrambling C)	Third password (scrambling CSPRNG)
(Whitening D)	Forth password (whitening CSPRNG)
(Enable B)	Second password enable/disable
(Enable C)	Third password enable/disable
(Enable D)	Forth password enable/disable

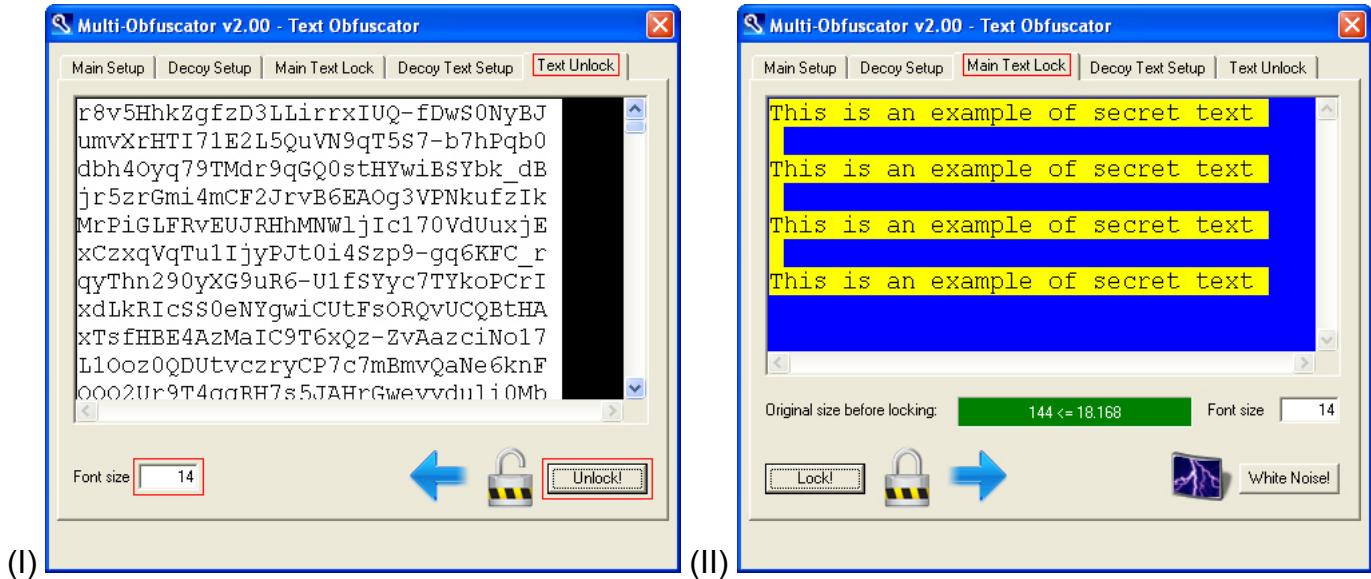
Set same set of passwords (secret to get secret data, decoy to get decoy data) and noise level as locking time. Full password and noise details are available in special separate sections:

- [ADVANCED PASSWORDS SETUP – UNLOCK](#)
- [OPTIONS: NOISE LEVEL](#)

Detailed decoy details are available here:

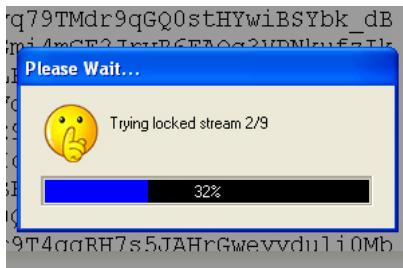
[WHAT IS DENIABLE CRYPTOGRAPHY?](#)

STEP 2:



(I) <TextEdit – black window >	Enter/paste a locked text
(Font size)	Text font size
(Unlock!)	Start unlocking

Choose the locked text you want to unlock. Locked text will not be overwritten and unlocked text (secret or decoy, depending on the set of passwords) will be saved to the *Main Text Lock* window, ready to be cut and pasted.



Aspect number: (960 / Data) – 1
-1 because of χ^2 -self-adjustment

Noise Level	Noise	Data	Aspects
300%	720	240	4 - 1
400%	768	192	5 - 1
500%	800	160	6 - 1
900%	864	96	10 - 1
1100%	880	80	12 - 1
1400%	896	64	15 - 1
1900%	912	48	20 - 1
2900%	928	32	30 - 1
5900%	944	16	60 - 1

Unlocking, even when passwords and locked text are ok, may take a long time due to the aspect number. The higher the noise level is, the more the aspects are. MultiObfuscator, by design, doesn't know which aspect was selected at locking time and has to slowly guess it by trial and error.

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WHITE NOISE AS A DECOY (TEXT)

BEGIN:

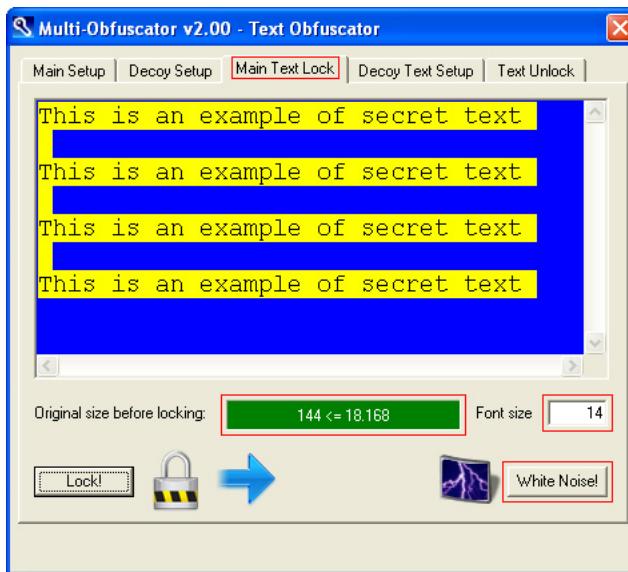


[\(Text Lock/Unlock\)](#)

Go to text (email format) panel

Select *Text Lock/Unlock*.

STEP 1:



<TextEdit – blue window >	Enter/paste a text
(Original size before locking)	Example: 144 bytes
(Font size)	Text font size
(White Noise!)	Start randomizing

Locked text is statistically undistinguishable from void randomized text. Advanced users will be able to add void/fake texts to the sensitive ones, in order to waste attackers' time. This task will save white noise only to a fake container compatible (by size) with the selected text.

FEATURES: PROGRAM ARCHITECTURE

Example:

- Noise level: 900%
- Size after locking: $((144 + 256) / 96) * 1280 = \mathbf{6.400}$ bytes ≤ 256 Kb
- White noise size: **6.400** bytes

Noise Level	Noise	Data	Min. Plain → Locked Size	Max. Plain → Locked Size
900%	864	96	1 B → 3840 B	18 Kb → 256 Kb

OPTIONS: NOISE LEVEL

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