UMA Synthetic Token Builder FAQ

Please note: this is a work in progress (WIP). We have listed a few questions here that we hope clarify how the Synthetic Token Builder works, but this is not an exhaustive list and we will add additional information over time. ***Please leave comments*** *with additional questions you might have, or feel free to reach out to us in our public developer* ***Slack****.*

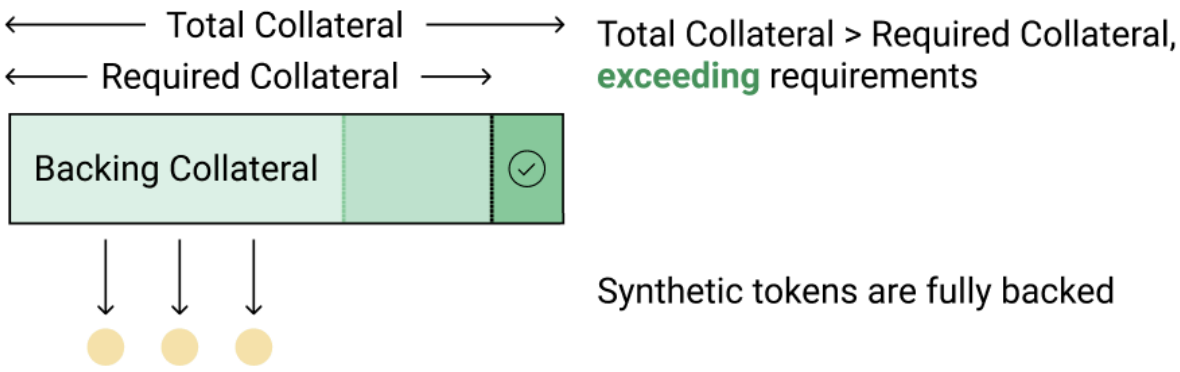
How do I access the UMA Synthetic Token Builder?

At **tokenbuilder.umaproject.org**! Please note that you'll need Metamask and you'll need to be **connected to the Rinkeby testnet**.

You'll also need Rinkeby testnet ETH and Rinkey testnet DAI—both are available from the links at the top of the Synthetic Token Builder dapp.

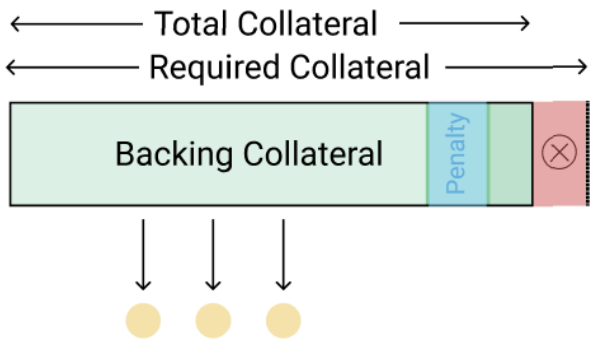
How does the UMA Synthetic Token Builder work?

Under the hood, the UMA Synthetic Token Builder creates a token facility by launching a smart contract. After you deposit DAI into your token facility, you're able to mint synthetic tokens that are fully backed by the DAI you deposited. Overcollateralizing your token facility ensures that the synthetic tokens are fully backed at all times, so the smart contract requires a minimum overcollateralization amount (you are welcome to add more than that as well). This helps reassure anyone buying your synthetic tokens that they're fully backed (by you).



What happens if a Token Facility is undercollateralized?

At any time, anyone can ask the smart contract to check if your token facility is undercollateralized. During this process, the smart contract checks what the latest price is from the price feed and checks if the amount of DAI you've maintained in the contract meets the required amount. If you do, you're all set. If you don't, the smart contract freezes all the collateral in the contract (you can't deposit or withdraw), and assesses a penalty.



Total Collateral < Required Collateral, **failing** to meet requirements

Token Facility owner pays **penalty** to owners of synthetic tokens

At expiry, how does a holder of synthetic tokens redeem their tokens?

Anyone who holds synthetic tokens that were minted by this token facility can redeem them for a proportional amount of the backing collateral, plus any penalty.

Before the token facility and its associated tokens mature, only the token facility owner can redeem tokens against the token facility for the backing collateral. After the token facility and its associated tokens mature, the amount of backing collateral in the token facility is fixed. Anyone who holds a synthetic token can redeem it against the token facility for associated collateral.

How does the dapp work under the hood?

The UMA Synthetic Token Builder is a front-end to a smart contract called TokenizedDerivative.sol that can be found in the UMA github (here). We'll call this smart contract "TD.sol" for the purposes of this post.

When you create a new token using the UMA Synthetic Token Builder, you are setting some parameters of TD.sol and then launching an instance of it (see the createTokenizedDerivative() function).

After you launch the contract (the Token Facility), you fund it by depositing money into the contract, which gets split and allocated into one of two accounts: the "Long" or "Short" account, depending on how many tokens you want to create from the facility (see the _depositAndCreateTokens() function).

The money in the "Long" account corresponds to the collateral that is being used to back 100% of the synthetic token's value. The money in the "Short" account represents how overcollateralized the token is, similar to the way that excess collateral in a CDP represents how overcollateralized the DAI is.

When the owner of a Token Facility deposits or withdraws collateral, the money is moved to/from the “Short” account.

If I want to get levered short exposure to a price feed, what do I do?

Use the UMA Synthetic Token Builder to build a Token Facility that creates tokens whose backing collateral tracks the price feed you are interested in getting levered short. After creating the Token Facility, mint tokens to yourself.

- Owning the Synthetic Tokens gives you long price exposure because the tokens' backing value will increase 1-for-1 with the price feed.
- Owning the Token Facility will give you levered short exposure to the price feed, since you will have to deposit collateral 1-for-1 into the facility if the price feed goes up (short exposure), but you initially only had to deposit a fraction of the initial value of the price feed (say, 50%, if you wanted to overcollateralize your facility by 50%).

At this stage, you both own the Token Facility and the Synthetic Tokens you created. Together, they neutralize any exposure to the price feed, so you have no exposure.

Therefore, to get levered short exposure to the price feed, sell the Synthetic Tokens you have created to someone else, and hold on to your ownership of the Token Facility.

If I want to get levered long exposure to a price feed, what do I do?

Please reach out to us directly on our Slack or Twitter, and we'll walk you through how to use UMA's TokenizedDerivative.sol contract to do this by creating a custom token facility via command line. Alternatively, you could wait for *someone else* to open a token facility and buy synthetic tokens that track a levered long price index from them.

How will you ensure that synthetic tokens are pegged to the right price?

Synthetic tokens should each trade at a price roughly equal to the backing collateral of the tokens divided by the number of tokens outstanding.

If the tokens are trading at a price below the proportional amount of backing collateral, the Token Facility owner should be willing to buy the tokens at a discount to the backing collateral and redeem them for the backing collateral, collecting the difference. Assuming markets are efficient, this should place upward pressure on the trading price of the token until it is in line with the backing collateral.

If the tokens are trading at a price above the proportional amount of backing collateral, the Token Facility owner should be able to issue more tokens from his Token Facility and sell them to the market at a premium to their backing collateral. Assuming markets are efficient, this should place downward pressure on the trading price of the token until it is in line with the backing collateral.

There are some reasonable concerns that "the market can stay irrational longer than [the owner of the Token Facility] can remain solvent". Namely, the owner of the Token Facility may not have enough capital on hand to support the buying or selling pressure needed to bring the synthetic

tokens' trading price in line with the backing collateral. While we recognize this as a potential market behavior, the beauty of open-source finance is that token facility owners have new options for managing this risk. For example, they can pool funds across multiple individuals, or deploy capital through an algorithmic risk management smart contract. Over time, as value scales, we expect the community's risk management sophistication to also grow!