Manual for Algorithmic Trading Application on SET and TFEX

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Trading via Algorithmic Trading

Algorithmic Trading, also known as automated or pre-programmed trading or robot trading, refers to a process of submitting trading orders using programs or software that automatically placing orders based on predetermined conditions. These conditions may include placing orders at volume-weighted average price (VWAP) or at the market price when it is lower than program-calculated price. Prominent features of Algorithmic Trading include the ability to submit trading orders without constantly monitoring market conditions, making emotional-free trading decisions, and promptly placing orders that require complex calculations of price or volume.

Both the Stock Exchange of Thailand (SET) and the Thailand Futures Exchange (TFEX) permit all types of investors to use Algorithmic Trading (in this document, collective as "**Users**") provided that **Users shall obtain prior permission from SET and TFEX and place orders through an approved Pre-Trade Risk Management (PTRM) of a member**. In this regard, members are responsible for contacting SET and TFEX to apply for Algorithmic Trading on behalf of their customers. The approval process of Algorithmic Trading does not required Users to disclose the source code of their Algorithmic Trading program, as the focus is on the overall market impact and the risk controls. On this basis, members will collaborate with Users to conduct risk management test on the provided test script under the test environment provided by SET and TFEX.

This document serves as a guideline for Algorithmic Trading application procedures, including the type of application, required documents and application process. Nonetheless, the usage of Algorithmic Trading involves additional elements such as the software used to connect to the Exchange, the trading user for sending orders and trading information etc.; Additional details can be found in Schedule 3.

1. Type of Algorithmic Trading application

The usage of Algorithmic Trading requires the User to submit orders through the approved PTRM of a member. There are two types of PTRM system: one that accommodates a specific trading strategy, and one that accommodates several trading strategies.

The differences between the two types of PTRM application can be summarized as follows:

1.1) Application for Algorithmic Trading via the PTRM which accommodates a specific trading strategy (SET only)

This application is for each specific trading strategies that the User intends to use. SET will assess the risks and measures to control related risks that may impact the overall trading system and trading conditions resulting from the specific strategies applied. An advantage of this application process is that the member is able to prepare the PTRM specific for their applied strategy, resulting in lower resource usage and the ability to promptly enhance the readiness of the PTRM. Nonetheless, in case the User wish to adopt additional trading strategies after the existing strategy has been approved by SET, the member will be required to apply for another PTRM that can manage the risk arising from the new strategies.

1.2) Application for Algorithmic Trading via the PTRM which accommodates several trading strategies (SET & TFEX)

A member is able to apply for the PTRM to accommodate Algorithm Trading involving several trading strategies. The submitted PTRM must be able to control various types of risks with a broader coverage than the PTRM for a specific trading strategy. An advantage of this type of application is that it allows flexibility in onboarding new trading strategies after the approval. In this regard, in case the existing approved PTRM is able to control the risks from the new strategies, the member can onboard new trading strategies without submitting additional application. The member must be responsible for recording information on the type of trading strategies and submit such information to SET and TFEX annually or upon request. Nevertheless, in case the existing PTRM deems to be unable to control the risks from the new trading strategies, the member is responsible for improving the PTRM and submitting additional application before onboarding the new strategies.

Summary of the Type of Application for Algorithmic Trading

Type of Application	SET	TFEX	Pros	Cons
Submission of orders via the PTRM which accommodates only **a specific strategy**	✓ Allow	Not applicable	Use less resources since members are able to develop PTRM specific to the specific strategy	Must submit additional application in case new strategies are introduced
Submission of orders via the PTRM which accommodates **several strategies**	✓ Allow	✓ Allow	After obtaining the permission, in case the approved PTRM is able to control the risks from the new strategies, new strategies may be introduced without additional application	Must develop the risk management system to be able to control risks with a broader coverage than PTRM for specific strategy.

Members who obtained permission before 8 May 2023

Members who obtained permission for Algorithmic Trading in SET before 8 May 2023 may contact the Securities Trading Department to inquire about the type of Algorithmic Trading permission you have obtained.

2. Recommendations for the PTRM system preparation

In preparing the PTRM system for both SET and TFEX, members shall establish and implement clear risk management policy and measures (additional details are in Schedule 1) and shall possess the minimum tools for the follow-up and management of risks as follows:

- **Kill Switches:** Member must have the ability to activate Kill Switches, which can promptly halt sending new orders and cancel all outstanding orders sent by Algorithmic Trading.
- **Order Verification**: A robust order verification system must be in place to ensure compliance with the Exchange's rules such as the security names, the order types, price, volume, price range etc.
- **Client screening and Risk assessment.** Daily credit limit controls must be implemented for each client, and members must ensure that **clients acknowledge and accept the risks** associated with the use of Algorithmic Trading.
- **Prevention of Inappropriate Trading Orders:** Member must establish a screening system or process to identify and prevent the submission of trading order that may potentially violate regulations on false market and/or relevant laws. In this regard, such prevention shall apply to the level of individuals, not pursuant to the types of accounts of the individuals (such as cash account, cash balance account, credit balance etc.). Examples of prevention include price control, prevention of continuous purchase or sale at several price levels, and prevention of Wash Sale orders etc.
- **Real-time Monitoring and Alert System:** A real-time monitoring and alert system should be in place to promptly identify and address any potential issues or troubleshooting needs.
- **Supervision of Software Configuration and Amendment:** Member must have the ability to oversee and manage the configuration and amendment of the software and its parameters, both by their clients and member's officer.
- **Annual Review of Risk Management System and Algorithmic Trading parameter:** A comprehensive risk management policy and process must be established to review the risk management system and algorithmic trading parameter at least once per year.
- **Recordkeeping**: Record of Algorithmic Trading activities and any modification to the parameters should be kept to facilitate inspections by the exchange.
- **User manual and training:** Members should provide a user manual or conduct training sessions for both officers and clients who engage Algorithmic Trading.
- **Troubleshooting Procedure and Manual:** A troubleshooting procedure, along with detailed troubleshooting manuals specifying authorized personnel and remedy process, should be developed.

The application for Algorithmic Trading will focus on the functions and the parameter of member's PTRM system such as whether and how the system can prevent submission of orders which result in drastic and

sudden change in the price within a short period of time etc. To assist members in this process, SET and TFEX have prepared the minimum guideline which the PTRM system should comply. Members may refer to the parameter in the below guideline as a reference.

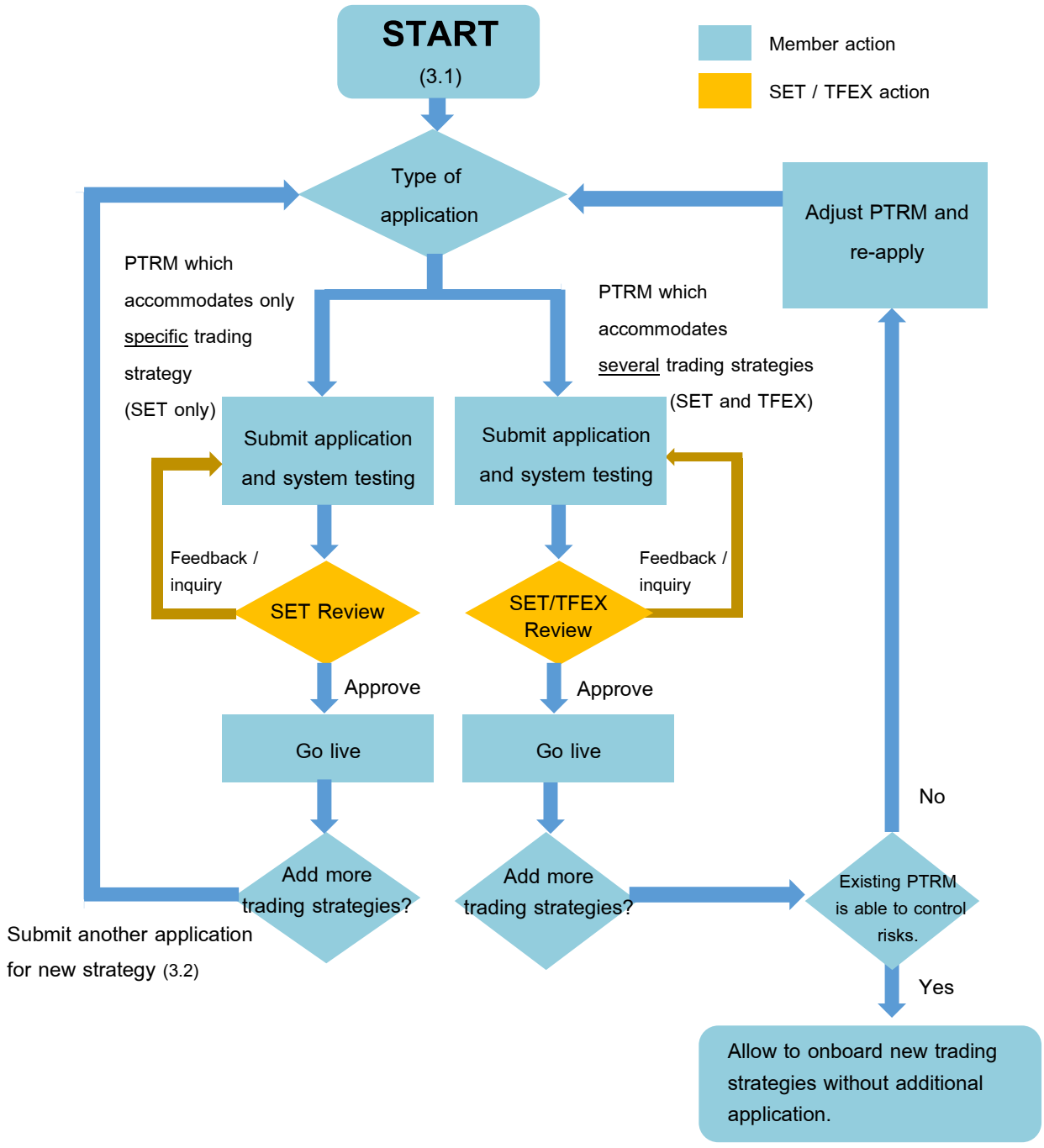
SET	Guidelines on Risk Management Regarding approval Algorithmic trading (Algo)
TFEX	Guidelines on Derivatives Contracts Trading Procedures

However, members may configurate parameters different from the guideline above provided if such parameters are able to prevent or control the submission of orders which may cause the price, volume or trading conditions to deviate from the normal market conditions.

3. Application Process

Application for Algorithmic Trading for SET and TFEX shall be undertaken separately albeit the process, supporting documents and the guideline for application are similar.

Application Flow



3.1 First-time application

Relevant forms

Members may fill in the required forms for Algorithmic Trading Application at Member Digital Form: https://www.setportal.set.or.th

Document	Description
MO-Member 1	**Request Form for Connection of the Company's Computer System to the Trading System of SET / TFEX** This form is for notifying the Exchange about any change regarding connection to SET and TFEX.
MO-PROG1	**Application for the Program Trading / Algorithmic Trading Software** This form is for indicate the details of Algorithmic Trading orders.
MO-Compliance1	**Details of trading supervision through member system** This form is to declare the details on risk management, along with its test result.
MO-API 1	**Form for Reporting the Intention to Utilize the API User on the SET CONNECT System** This form is for request Trading Users.

Supporting documents

Document	Description
Solution Description and Specification	A document showing the details of hardware and software used in the connection (to be submitted together with MO-Member1)
System and Network Diagram	The details and diagram showing the connectivity (to be submitted together with MO-Member1)
User's Information	Name and details of the User (to be submitted prior onboarding the approved Algorithm Trading)

Application process

1 Submit the application via the Member Digital Form system

The officers of members who have log-in user of Member Digital Form can submit the application at https://www.setportal.set.or.th

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2 Test PTRM system and submit the testing result

Members may use the test script, username and password shown in the Member Digital Form to conduct the test under the test environment provided by the Exchange. Members are required to take a screenshot of the test result or present other testing evidence in the application form; the screenshot or testing evidence must clearly show the testing date and time. The application must also specify the name of the persons conducting the test.

The test result along with other required documents can be submitted online by the authorized person of the member.

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3 SET / TFEX considers the application

In case SET / TFEX has additional questions or recommendations concerning improvement to the PTRM system, members may be required to coordinate with Users in order to submit additional information or conduct additional test.

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4 SET / TFEX grants the permission

After SET / TFEX grants the permission, members shall notify the information of investors who wish to use Algorithmic Trading system to SET and TFEX before onboarding the Algorithmic Trading.

3.2 Subsequent application

If the first application is for a specific strategy (SET only)	Members are required to submit new application in order to onboarding new strategies pursuant to 3.1
If the first application is for the PTRM which accommodates several strategies	Members are required to assess whether the approved PTRM is able to control the risks from the new trading strategies. If yes, the new trading strategies may be onboarded without additional application. In this regard, members shall keep the information on strategies used, such as summary of the number of passive strategies or aggressive strategies used within the previous year etc., and submit the information to SET/TFEX at least once per year or upon request. Nonetheless, if the existing PTRM system deems to be unable to control the risks from the new trading strategies, members must improve the PTRM system and re-apply the PTRM with SET / TFEX before onboarding the new strategies.

Relevant regulations

SET

- GorKor.(Wor)002/ 2023 Notification for the Revision of Guideline on Risk Management for Algorithmic Trading Pre-trade Usage Approval (Algorithmic Guideline)
- Bor.Sor./Sor.01-27 Procedures on Trading, Clearing and Settlement of Securities in the Exchange B.E. 2560 (2017)
- Practice Guideline regarding Trading, Clearing and Settlement of Securities in the Exchange (No. 3)

TFEX

- Guidelines on Derivatives Contracts Trading Procedures
- Code of Conduct on Derivatives Trading

Appendix

Schedule 1: Recommendation for Members in Determining the Framework for Risk Control

(Risk Governance & Framework)

Members shall have well-defined risk management policy in place. Examples of important elements for risk control framework are as follows:

1. **Policy and methods for managing risks associated with trading orders**
   - **Establish a risk management policy and process** for submission of trading orders using Algorithmic Trading such as policy on development, testing and deployment of the system, policy on supervising the use of Algorithmic Trading by customers and policy on **reviewing** of risk management procedure regularly etc.
   - **Designate a specific supervision unit responsible for ensuring compliance** with the prescribed policy and risk management framework. Clearly define the **roles and responsibilities of this unit, including** supervision of Algorithmic Trading activities, signoff process, decision-making for new strategies or change to existing strategies, incident response, and regularly review of the risk management measures and relevant parameters.
2. **Procedures and process for troubleshooting**
   - Develop clear **procedures and process for addressing day-to-day problems** promptly and efficiently and assign authorized persons to make decision on relevant matters.
   - **In the event of system issues or technical problems** related to Algorithmic Trading that could potentially cause abnormality or impact the overall market, the member should **immediately notify SET / TFEX and collaborate in formulating** an action plan to minimize the market impact.
3. **Policy and procedures for recording information for inspection or reference (audit trails)**
   - Implement the **system to record all transactions related to Algorithmic Trading,** including procedures, trading strategies, supervision, development and deployment.
   - **Collect and record reports** on risk management measures, changes to the Algorithmic Trading parameters, customers information, employed strategies, and incident report.
4. **Educate the related personnel and Users regarding the usage of the orders submission system and Algorithmic Trading**
   - Provide trainings to relevant officers to enhance their understanding of Algorithmic Trading, including operating principles, risk control, problems identification, and methods for addressing preliminary issues.
   - Provide training to Algorithmic Trading Users to ensure they possess sufficient knowledge and understanding for effective usage.

Schedule 2: Other Information Related to the use of Algorithm Trading

When considering the application for Algorithmic Trading, members should also take into account the following details:

1. **Software used for the connection**

   The trading connection between members and SET/TFEX is facilitated through a software developed by an Independent Software Vendor (ISV) who has passed the certification test for connection to the trading system of SET and TFEX. A list of certified ISVs can be found here. In case a member intended to use a software that has not yet certified, the system developer can request certification by contacting ISV_Access_Support@set.or.th.

2. **Trading User**

   Members are required to submit trading orders via an API User. To request additional API User, members can access the Member Digital Form system here: https://www.setportal.set.or.th.

3. **Throttle**

   Throttle is one of the risk control mechanisms used to manage the amount of information that can be sent via the API User between members and SET/TFEX. At present, members may send information up to 25 messages per second per throttle for SET, and up to 10 messages per second per throttle for TFEX. In case members wish to request for additional throttle, they can submit a request through the Member Digital Form system: https://www.setportal.set.or.th.

4. **Trading information**

   In case Users wish to incorporate real-time trading information into their Trading Algorithm, members may contact the Information Services Department for additional details at infoproducts@set.or.th.

Schedule 3: Related Fees

At present, SET and TFEX do not charge service fee for the application for Algorithmic Trading. Other services related to the use of Algorithmic Trading are available as below.

Service	Fee	Remarks
Service fee for the application for Algorithmic Trading and for system testing	No fee	
System testing fee	No fee	
Trading User fee	Baht 5,000 per User	Optional (depending on the connectivity design by members)
Throttle fee	SET: Baht 125,000 per month per 1 Throttle TFEX: Baht 10,000 per month per 1 Throttle	
Trading information fee	Depending on the type of usage	Members may contact the Information Services Department for additional information at infoproducts@set.or.th

Note: Data as of April 2023