

Data Dictionary

USER

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the user	Positive integer
email	String	-	UNIQUE, NOT NULL	Email address of the user, used for authentication	Valid email format
password_hash	String	-	NOT NULL	Hashed password for user authentication	Encrypted string
role	Enum	-	NOT NULL, DEFAULT: USER	User role defining access level	ANONYMOUS, USER, ADMIN
is_banned	Boolean	-	NOT NULL, DEFAULT: false	Indicates if the user account is banned	true, false
stripe_customer_id	String	-	NULLABLE, UNIQUE	Stripe customer identifier for billing	Stripe customer ID format
password_reset_code	String	-	NULLABLE	Temporary 6-digit code for password reset functionality	Numeric string (6 digits)
password_reset_expires_at	DateTime	-	NULLABLE	Expiration timestamp for the password reset code	ISO 8601 datetime or NULL
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the user account was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the user record was last modified	ISO 8601 datetime

USER_SESSION

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the session	Positive integer
user_id	Integer	-	FK → USER(id), NOT NULL	Reference to the user who owns this session	Existing user identifier
ip_address	String	-	NOT NULL	IP address from which the session was initiated	IPv4 or IPv6 format
user_agent	String	-	NOT NULL	Browser/client user agent string	HTTP user agent string

Attribute	Type	Size	Constraints	Description	Domain
device_info	String	-	NOT NULL	Information about the device used for the session	Device description string
issued_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the session token was issued	ISO 8601 datetime
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the session record was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the session record was last modified	ISO 8601 datetime

Index: user_id

On Delete: CASCADE (user deletion removes all user sessions)

PLAN

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the plan	Positive integer
code	String	-	UNIQUE, NOT NULL	Internal code identifier for the subscription plan	Alphanumeric code
stripe_product_id	String	-	NOT NULL	Stripe product identifier	Stripe product ID format
stripe_price_id	String	-	NOT NULL	Stripe price identifier	Stripe price ID format
currency	String	3	NOT NULL	Currency code for the plan price	ISO 4217 currency code (e.g., USD, EUR)
price	Decimal	10,2	NOT NULL	Price of the subscription plan	Positive decimal number
max_active_sessions	Integer	-	NOT NULL, DEFAULT: 1	Maximum number of active (non-archived) sessions allowed for this plan	Positive integer
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the plan was created	ISO 8601 datetime

Attribute	Type	Size	Constraints	Description	Domain
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the plan record was last modified	ISO 8601 datetime

SUBSCRIPTION

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the subscription	Positive integer
user_id	Integer	-	FK → USER(id), NOT NULL	Reference to the user who owns this subscription	Existing user identifier
plan_id	Integer	-	FK → PLAN(id), NOT NULL	Reference to the subscribed plan	Existing plan identifier
stripe_subscription_id	String	-	UNIQUE, NOT NULL	Stripe subscription identifier	Stripe subscription ID format
status	Enum	-	NOT NULL	Current status of the subscription	active, canceled
current_period_start	DateTime	-	NOT NULL	Start date of the current billing period	ISO 8601 datetime
current_period_end	DateTime	-	NOT NULL	End date of the current billing period	ISO 8601 datetime
cancel_at_period_end	Boolean	-	NOT NULL, DEFAULT: false	Indicates if subscription will be canceled at period end	true, false
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the subscription was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the subscription record was last modified	ISO 8601 datetime

Indexes: user_id, plan_id

On Delete (user_id): CASCADE (user deletion removes all subscriptions)

STRIPE_EVENT

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the event record	Positive integer
stripe_event_id	String	-	UNIQUE, NOT NULL	Stripe event identifier	Stripe event ID format
type	String	-	NOT NULL	Type of the Stripe webhook event	Stripe event type string
payload	JSON	-	NOT NULL	Complete JSON payload of the Stripe event	Valid JSON object
received_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the event was received	ISO 8601 datetime
processed_at	DateTime	-	NULLABLE	Timestamp when the event was processed	ISO 8601 datetime or NULL
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the event record was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the event record was last modified	ISO 8601 datetime

INSTRUMENT

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the instrument	Positive integer
symbol	String	-	UNIQUE, NOT NULL	Trading symbol identifier (e.g., EURUSD, GBPUSD)	Standard trading symbol format
display_name	String	-	NOT NULL	Human-readable name for the instrument	Display string
pip_size	Decimal	10,8	NOT NULL	Size of one pip for the instrument	Positive decimal number

Attribute	Type	Size	Constraints	Description	Domain
contract_size	Integer	-	NOT NULL, DEFAULT: 100000	Standard contract size for the instrument	Positive integer
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the instrument was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the instrument record was last modified	ISO 8601 datetime

DATASET

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the dataset	Positive integer
instrument_id	Integer	-	FK → INSTRUMENT(id), NOT NULL	Reference to the instrument this dataset belongs to	Existing instrument identifier
timeframe	Enum	-	NOT NULL	Timeframe for the market data	M1, M5, M10, M15, M30, H1, H2, H4, D1, W1
uploaded_at	DateTime	-	NULLABLE	Timestamp when the dataset was uploaded	ISO 8601 datetime or NULL
records_count	Integer	-	NULLABLE	Number of records in the dataset	Positive integer or NULL
file_name	String	-	NULLABLE	Original filename of the uploaded dataset	File name string or NULL
start_time	DateTime	-	NULLABLE	Start timestamp of the data range	ISO 8601 datetime or NULL
end_time	DateTime	-	NULLABLE	End timestamp of the data range	ISO 8601 datetime or NULL
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the dataset was created	ISO 8601 datetime

Attribute	Type	Size	Constraints	Description	Domain
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the dataset record was last modified	ISO 8601 datetime

Index: instrument_id

CANDLE (ClickHouse)

Note: This table is stored in ClickHouse for optimized time-series performance.

Engine: ReplacingMergeTree(updated_at)

Partition: By month (toYYYYMM(ts))

Attribute	Type	Size	Constraints	Description	Domain
instrument_id	UInt32	-	NOT NULL	Instrument associated with the candle	Existing instrument identifier
timeframe	String	-	NOT NULL	Timeframe of the candle	M1, M5, M10, M15, M30, H1, H2, H4, D1, W1
ts	DateTime	-	NOT NULL	Timestamp of the candle (start of the period)	ISO 8601 datetime
open	Decimal64	8	NOT NULL	Opening price of the candle	Positive decimal number
high	Decimal64	8	NOT NULL	Highest price during the candle period	Positive decimal number, >= open, >= low
low	Decimal64	8	NOT NULL	Lowest price during the candle period	Positive decimal number, <= open, <= high
close	Decimal64	8	NOT NULL	Closing price of the candle	Positive decimal number
volume	Float64	-	NOT NULL	Trading volume for the candle period	Non-negative number
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the candle record was created	ISO 8601 datetime

Attribute	Type	Size	Constraints	Description	Domain
updated_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the candle record was last modified	ISO 8601 datetime

Primary Key: (instrument_id, timeframe, ts)

Indexes:

- idx_instrument_timeframe: (instrument_id, timeframe) TYPE minmax
- idx_ts: (ts) TYPE minmax

SESSION

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the trading session	Positive integer
user_id	Integer	-	FK → USER(id), NOT NULL	Reference to the user who owns this session	Existing user identifier
instrument_id	Integer	-	FK → INSTRUMENT(id), NOT NULL	Reference to the instrument being traded	Existing instrument identifier
name	String	-	NULLABLE	User-defined name for the trading session	Alphanumeric string or NULL
session_status	Enum	-	NOT NULL, DEFAULT: PAUSED	Current status of the trading session	RUNNING, PAUSED, ARCHIVED
speed	Enum	-	NOT NULL, DEFAULT: SPEED_1X	Playback speed multiplier for the session	SPEED_0_5X (0.5x), SPEED_1X (1x), SPEED_2X (2x), SPEED_3X (3x), SPEED_5X (5x), SPEED_10X (10x), SPEED_15X (15x)
start_time	DateTime	-	NOT NULL	Start timestamp of the trading session	ISO 8601 datetime
current_time	DateTime	-	NOT NULL	Current timestamp in the session playback	ISO 8601 datetime, >= start_time
end_time	DateTime	-	NULLABLE	End timestamp of the trading session	ISO 8601 datetime or NULL, >= start_time

Attribute	Type	Size	Constraints	Description	Domain
initial_balance	Decimal	18,8	NOT NULL	Initial account balance for the session	Positive decimal number
current_balance	Decimal	18,8	NOT NULL	Current account balance for the session	Non-negative decimal number
leverage	Integer	-	NOT NULL, DEFAULT: 1	Leverage multiplier for trading positions	Positive integer (typically 1, 50, 100, 200, 500, 1000)
spread_pts	Decimal	10,4	NOT NULL, DEFAULT: 0	Spread cost in points	Non-negative decimal number
slippage_pts	Decimal	10,4	NOT NULL, DEFAULT: 0	Slippage cost in points	Non-negative decimal number
commission_per_fill	Decimal	10,4	NOT NULL, DEFAULT: 0	Commission cost per trade fill	Non-negative decimal number
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the session was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the session record was last modified	ISO 8601 datetime

Indexes: user_id, instrument_id

On Delete (user_id): CASCADE (user deletion removes all sessions)

POSITION

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the position	Positive integer
session_id	Integer	-	FK → SESSION(id), NOT NULL	Reference to the session this position belongs to	Existing session identifier
position_status	Enum	-	NOT NULL, DEFAULT: OPEN	Current status of the trading position	OPEN, CLOSED, LIQUIDATED
side	Enum	-	NOT NULL	Direction of the position	BUY, SELL
quantity_lots	Decimal	18,8	NOT NULL	Size of the position in lots	Positive decimal number

Attribute	Type	Size	Constraints	Description	Domain
tp_price	Decimal	18,8	NULLABLE	Take profit price level	Positive decimal number or NULL
sl_price	Decimal	18,8	NULLABLE	Stop loss price level	Positive decimal number or NULL
entry_price	Decimal	18,8	NOT NULL	Price at which the position was opened	Positive decimal number
exit_price	Decimal	18,8	NULLABLE	Price at which the position was closed	Positive decimal number or NULL
opened_at	DateTime	-	NOT NULL	Timestamp when the position was opened	ISO 8601 datetime
closed_at	DateTime	-	NULLABLE	Timestamp when the position was closed	ISO 8601 datetime or NULL, >= opened_at
realized_pnl	Decimal	18,8	NULLABLE	Realized profit or loss for closed positions	Decimal number (can be negative) or NULL
unrealized_pnl	Decimal	18,8	NULLABLE	Unrealized profit or loss for open positions (updated on bar advancement)	Decimal number (can be negative) or NULL
commission_cost	Decimal	18,8	NULLABLE	Total commission cost for the position	Non-negative decimal number or NULL
slippage_cost	Decimal	18,8	NULLABLE	Total slippage cost for the position	Non-negative decimal number or NULL
spread_cost	Decimal	18,8	NULLABLE	Total spread cost for the position	Non-negative decimal number or NULL
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the position was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the position record was last modified	ISO 8601 datetime

Index: session_id

On Delete (session_id): CASCADE (session deletion removes all positions)

TRANSACTION

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the transaction	Positive integer
session_id	Integer	-	FK → SESSION(id), NULLABLE	Reference to the session this transaction belongs to	Existing session identifier or NULL
transaction_type	Enum	-	NOT NULL	Type of the transaction	DEPOSIT, WITHDRAWAL, COMMISSION, PNL, SLIPPAGE, SPREAD, ADJUSTMENT
amount	Decimal	18,8	NOT NULL	Transaction amount (can be positive or negative)	Decimal number (can be negative)
balance_after	Decimal	18,8	NOT NULL	Account balance after this transaction	Non-negative decimal number
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the transaction was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the transaction record was last modified	ISO 8601 datetime

Index: session_id

On Delete (session_id): SET NULL (session deletion sets session_id to NULL)

QUEUE_JOB

Attribute	Type	Size	Constraints	Description	Domain
id	Integer	-	PK, AUTO INCREMENT	Unique identifier for the queue job	Positive integer
type	String	-	NOT NULL	Type/name of the job to be processed	Job type identifier string
status	Enum	-	NOT NULL, DEFAULT: PENDING	Current status of the job	PENDING, PROCESSING, COMPLETED, FAILED, RETRYING, QUEUE_FAILED, PERMANENTLY_FAILED

Attribute	Type	Size	Constraints	Description	Domain
payload	JSON	-	NOT NULL	Full payload data for the job	Valid JSON object
error	String	-	NULLABLE	Error message if the job failed	Error description string or NULL
retry_count	Integer	-	NOT NULL, DEFAULT: 0	Number of retry attempts made	Non-negative integer
next_attempt_at	DateTime	-	NULLABLE	Timestamp for the next retry attempt	ISO 8601 datetime or NULL
created_at	DateTime	-	NOT NULL, DEFAULT: now()	Timestamp when the job was created	ISO 8601 datetime
updated_at	DateTime	-	NOT NULL, AUTO UPDATE	Timestamp when the job record was last modified	ISO 8601 datetime
processed_at	DateTime	-	NULLABLE	Timestamp when the job was processed	ISO 8601 datetime or NULL

Indexes: status, type, created_at, (status, next_attempt_at)

Enumeration Domains

Role

- **ANONYMOUS:** Anonymous user with limited access
- **USER:** Standard authenticated user
- **ADMIN:** Administrator with full access

SessionStatus

- **RUNNING:** Session is currently active and running
- **PAUSED:** Session is paused
- **ARCHIVED:** Session is archived and no longer active

Timeframe

- **M1:** 1 minute
- **M5:** 5 minutes
- **M10:** 10 minutes
- **M15:** 15 minutes
- **M30:** 30 minutes
- **H1:** 1 hour

- **H2:** 2 hours
- **H4:** 4 hours
- **D1:** 1 day
- **W1:** 1 week

Speed

- **SPEED_0_5X:** 0.5x speed (half speed)
- **SPEED_1X:** 1x speed (normal speed)
- **SPEED_2X:** 2x speed
- **SPEED_3X:** 3x speed
- **SPEED_5X:** 5x speed
- **SPEED_10X:** 10x speed
- **SPEED_15X:** 15x speed

PositionStatus

- **OPEN:** Position is currently open
- **CLOSED:** Position has been closed normally
- **LIQUIDATED:** Position was liquidated (forced closure)

Side

- **BUY:** Long position (buying)
- **SELL:** Short position (selling)

TransactionType

- **DEPOSIT:** Money deposited into account
- **WITHDRAWAL:** Money withdrawn from account
- **COMMISSION:** Commission fee charged
- **PNL:** Profit and loss from trading
- **SLIPPAGE:** Slippage cost
- **SPREAD:** Spread cost
- **ADJUSTMENT:** Manual adjustment to balance

SubscriptionStatus

- **active:** Subscription is active and paid
- **canceled:** Subscription has been canceled

JobStatus

- **PENDING:** Job is waiting to be processed
 - **PROCESSING:** Job is currently being processed
 - **COMPLETED:** Job has been successfully completed
 - **FAILED:** Job failed during processing
 - **RETRYING:** Job is scheduled for retry
 - **QUEUE_FAILED:** Job failed to be queued
 - **PERMANENTLY_FAILED:** Job has permanently failed after all retry attempts
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Notes on Data Types

- **Integer:** Whole number (32-bit signed integer, auto-incremented for primary keys)
 - **UInt32:** Unsigned 32-bit integer (ClickHouse specific)
 - **String:** Variable-length character string
 - **Decimal (precision, scale):** Fixed-precision decimal number
 - First number: total number of digits
 - Second number: number of digits after decimal point
 - **Decimal64 (scale):** 64-bit fixed-precision decimal (ClickHouse specific)
 - **Float64:** 64-bit floating-point number (ClickHouse specific)
 - **Boolean:** Logical value (true/false)
 - **DateTime:** Date and time value (ISO 8601 format)
 - **Enum:** Enumerated type with predefined values
 - **JSON:** JavaScript Object Notation data structure
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Database Notes

PostgreSQL Tables

All tables except CANDLE are stored in PostgreSQL using Prisma ORM.

ClickHouse Tables

The CANDLE table is stored in ClickHouse for optimized time-series query performance. This table uses:

- **ReplacingMergeTree** engine for efficient upsert operations (deduplication based on primary key, keeping the latest `updated_at`)
- **Monthly partitioning** for efficient data management and pruning
- **MinMax indexes** for faster range queries on common access patterns