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DAYTRADING STATISTICS

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E-Mini S&P 500

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Discover the past statistical behaviour. The many statistics will provide you with trading ideas and make you think of opportunities you didn't consider before

STUDY
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NOTICE

THE STATISTICS IN THIS REPORT ARE GENERATED USING MINUTE DATA FROM
DECEMBER 11, 2015 to DECEMBER 30, 2020

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INITIAL BALANCE

The Initial Balance (IB) is defined by the High and Low set during the First Hour of trading during the Regular Trading Hours (RTH). For European Equity indexes, 2 hours are considered (8am CET to 10am CET). This covers the old Eurex futures open until the first hour of equity trading has completed. Results have shown this timeframe to be more statistically significant.

The Initial Balance is essentially the support and resistance found during the first hour. This provides clues as to who is in the market as well as give us a reference which carries statistical significance.

In this 15 min Candlestick chart, the Initial Balance is represented by the Gold dashed lines.

In the following sections you can discover what the historical probabilities are surrounding these initial Support & Resistance levels.

INITIAL BALANCE BREAK OUT

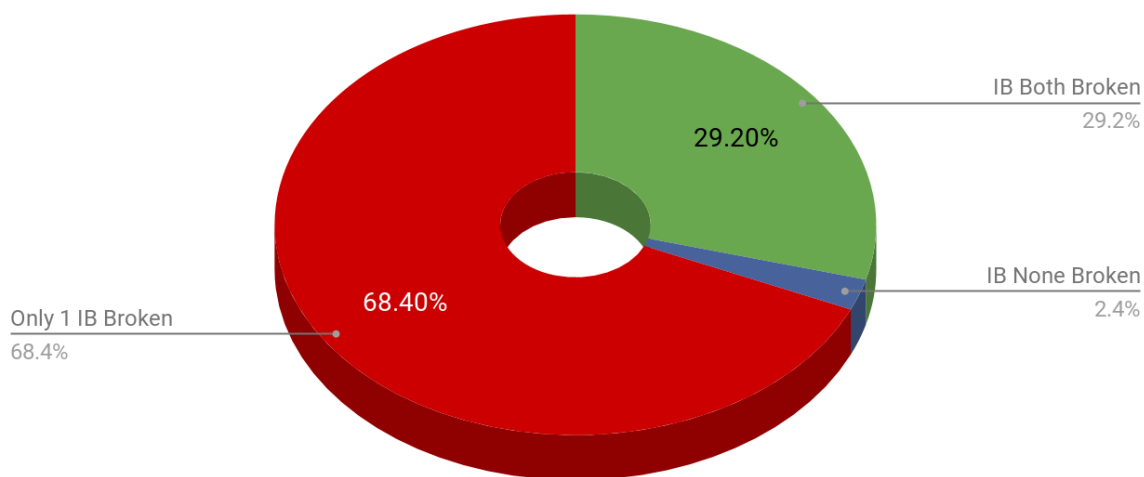## Initial Balance Break Out - Historical Probabilities

IB Both Broken		29.20%
IB None Broken		2.40%
Only 1 IB Broken		68.40%
Samples		1291
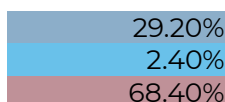
INITIAL BALANCE HISTORICAL PROBABILITIES

Initial Balance Historical Probabilities
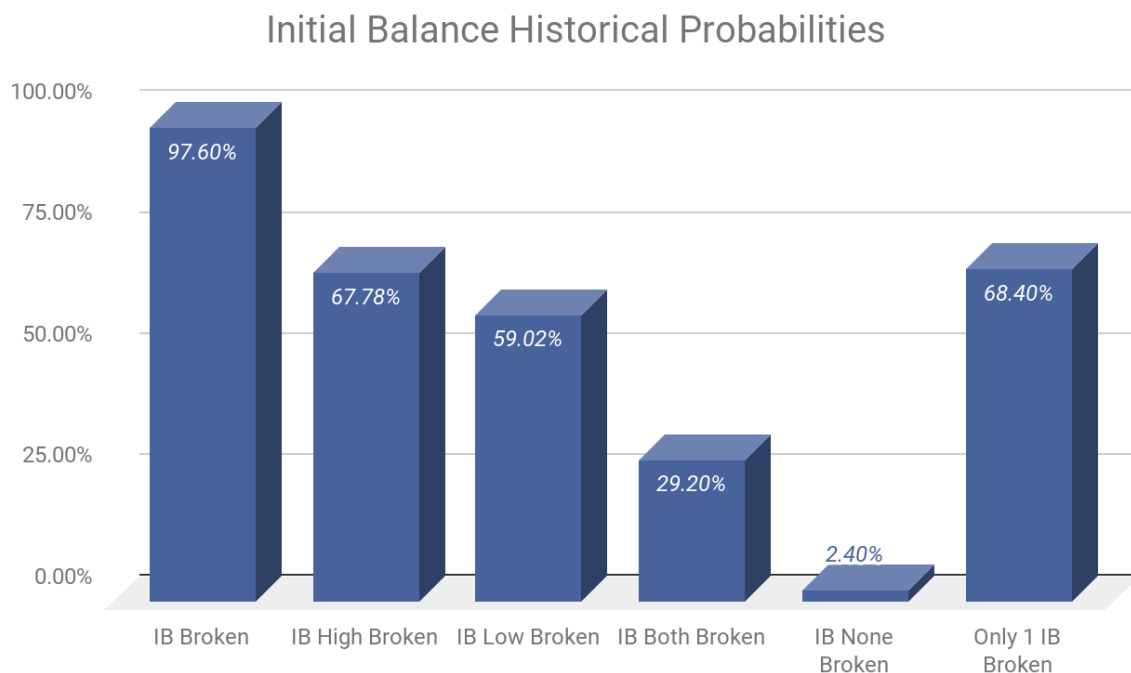
IB Broken	97.60%
IB High Broken	67.78%
IB Low Broken	59.02%
IB Both Broken	29.20%
IB None Broken	2.40%
Only 1 IB Broken	68.40%

Samples	1291

IB Broken: either the Initial Balance High, Low or even both were broken during the Regular Trading Hours Session

IB High Broken: the Initial Balance High was broken during the Regular Trading Hours Session

IB Low Broken: the Initial Balance Low was broken during the Regular Trading Hours Session

IB Both Broken: the Initial Balance High & Low were broken during the Regular Trading Hours Session

Only 1 IB Broken: Initial Balance High or Low was broken during the Regular Trading Hours Session

Neutral Follow Neutral: When both Initial Balance High & Low were broken, probability of the next RTH session to again break Initial Balance High & Low
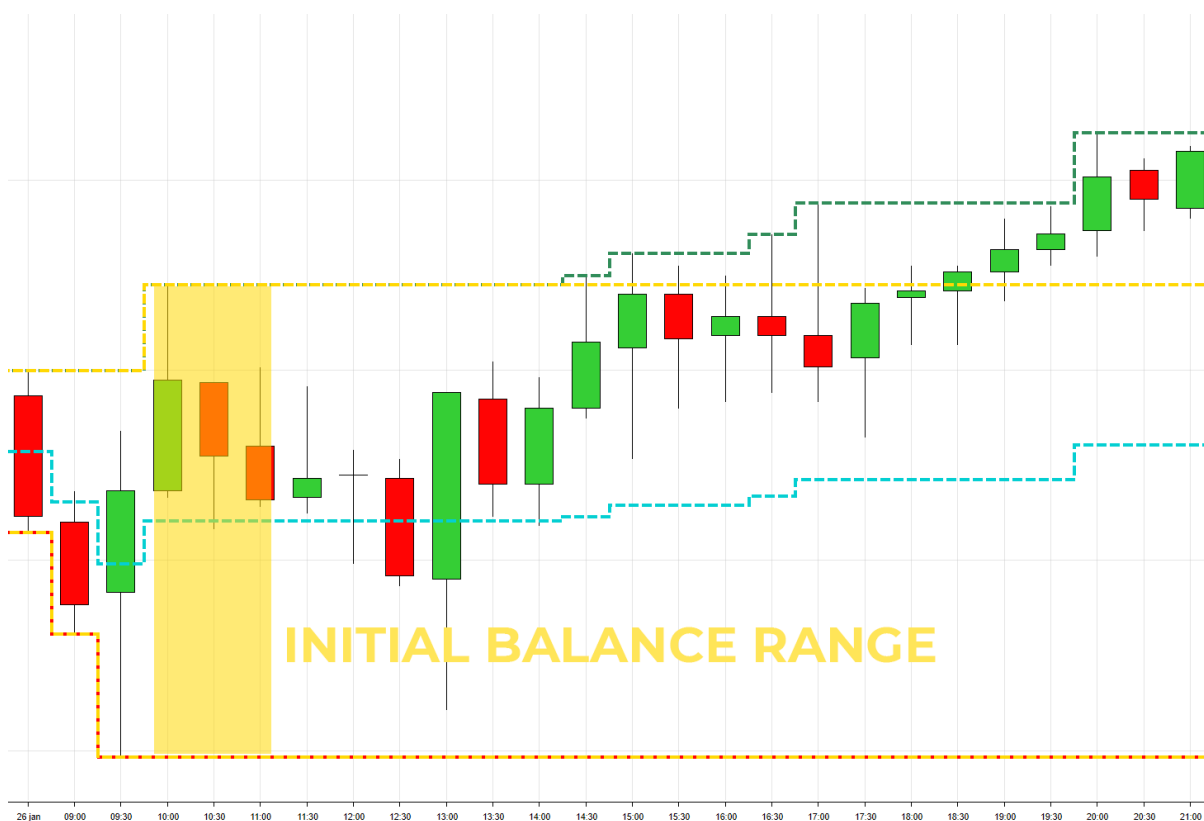
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RANGE DISTRIBUTION

The **Initial Balance Range** is defined by subtracting the Initial Balance Low from the Initial Balance High.

In these statistics we analyze the range of the Initial Balance across all samples (=days).

INITIAL BALANCE RANGE

In this 15 min Candlestick chart, the Initial Balance Range is represented by the Gold vertical bar.

Most Common Range (POC)	**8**	
Average Range	**13.92**	
Standard Deviation	16.82	
Normal Range (1 STD Dev)	-2.90to	30.74
Samples	1291	

📎 To view the Distribution Chart, please refer to the attachments that came with this report.
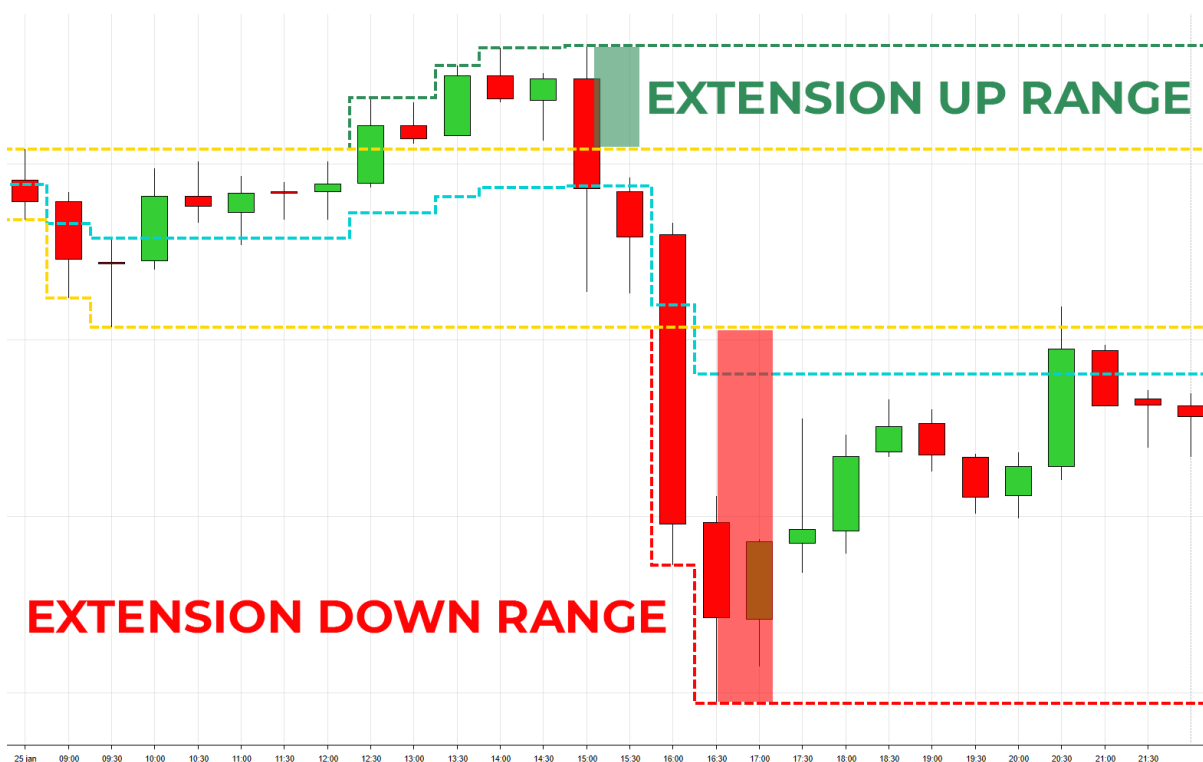
RANGE EXTENSION

Range Extension occurs when the Initial Balance High or Low is broken.
It is calculated as follows:

Extension UP = Session High - Initial Balance High

Extension DOWN = Initial Balance Low - Session Low

For these Statistics we only take into account the extension that happens during the Regular Trading Hours Session.

In this 15 min Candlestick chart, the Extension Up Range is represented by the Green translucent vertical bar. The Extension Down Range is represented by the Red translucent vertical bar.

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EXTENSION UP DISTRIBUTION

Most Common Range (POC)	**1.5**	
Average Range	**9.54**	
Standard Deviation	14.97	
Normal Range (1 STD Dev)	-5.43to	24.51
Samples	875	

> 📎 To view the Distribution Chart, please refer to the attachments that came with this report.

EXTENSION DOWN DISTRIBUTION

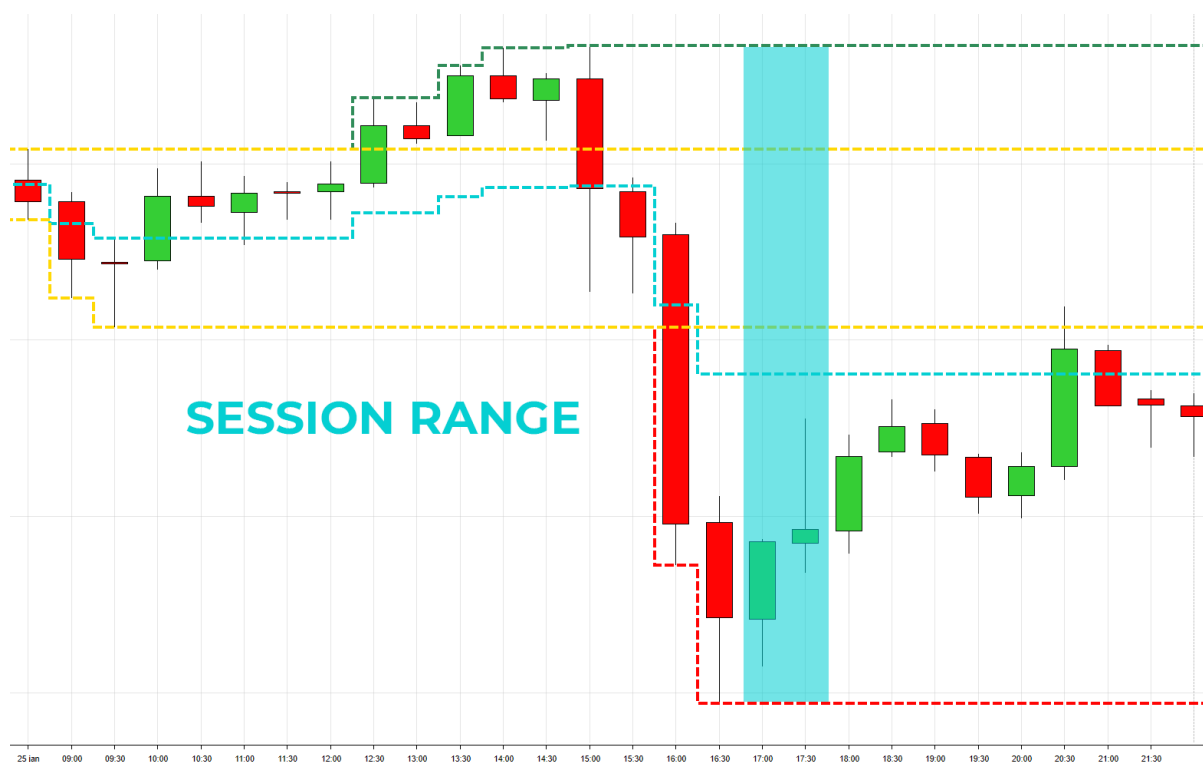|		
Most Common Range (POC)	**0.5**	
Average Range	**12.76**	
Standard Deviation	21.09	
Normal Range (1 STD Dev)	-8.33to	33.85
Samples	762	

> 📎 To view the Distribution Chart, please refer to the attachments that came with this report.

SESSION RANGE

The **Session Range** is defined by subtracting the Session Low from the Session High.

In these statistics we analyze the range of the Session across all samples (=days).

In this 15 min Candlestick chart, the Session Range is represented by the Blue translucent vertical bar.

Most Common Range (POC)	**10.5**	
Average Range	**27.92**	
Standard Deviation	33.73	
Normal Range (1 STD Dev)	-5.81to	61.65
Samples	1291	

📎 To view the Distribution Chart, please refer to the attachments that came with this report.

SESSION CLOSE

In this section we will be looking at the Session closing price, compared to other intraday levels like the Mid. The Session Mid is calculated as such: (Session Low + Session High) / 2.
Both the Session Mid as the Day Mid can be plotted by the ChartSpots Initial Balance indicator for NinjaTrader 8.

In this 15 min Candlestick chart, the Initial Balance High & Low are represented by the Gold dashed lines, the Session High as the Green dashed line, the Session Low as the Red dashed line and the Session Mid as the Blue dashed line. The Close for this day is circled in black.

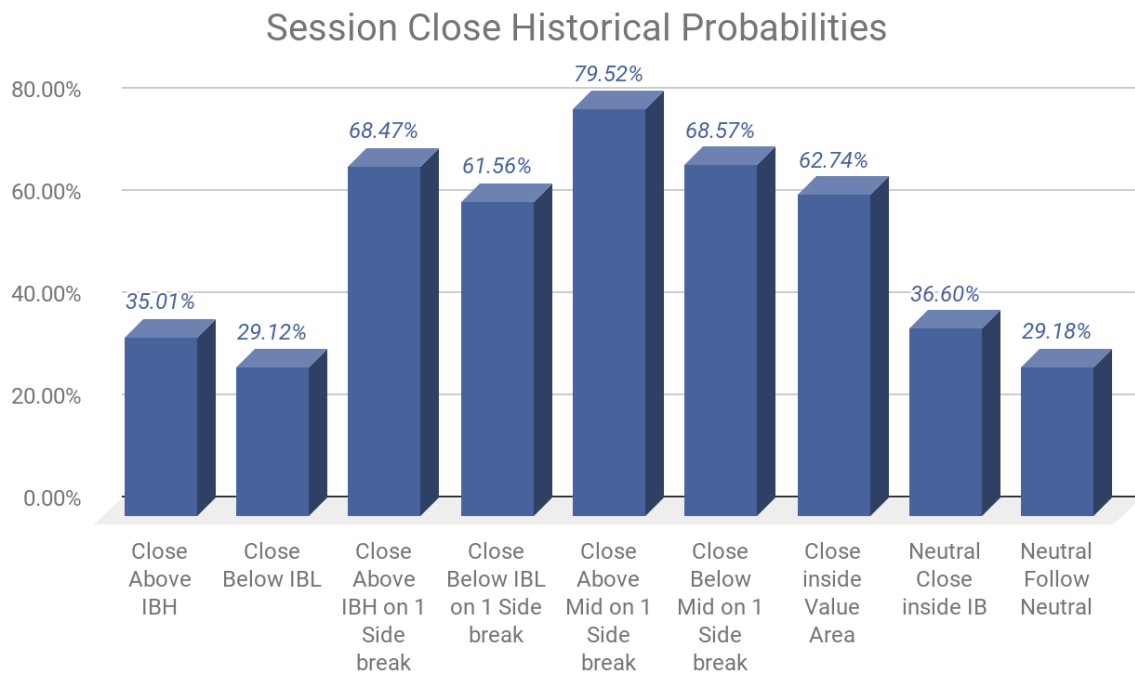## SESSION CLOSE HISTORICAL PROBABILITIES

Session Close Historical Probabilities

|	
Close Above IBH	35.01%
Close Below IBL	29.12%
Close Above IBH on 1 Side break	68.47%
Close Below IBL on 1 Side break	61.56%
Close Above Mid on 1 Side break	79.52%
Close Below Mid on 1 Side break	68.57%
Close inside Value Area	62.74%
Neutral Close inside IB	36.60%
Neutral Follow Neutral	29.18%
Samples	1291

DAY TYPES

Traditionally the daytypes are categorized as follows: **Normal**, **Normal Variation**, **Trend** and **Neutral**.

NORMAL DAY

When 85% or more of the range is defined in the Initial Balance period it is considered as a **Normal Day**.
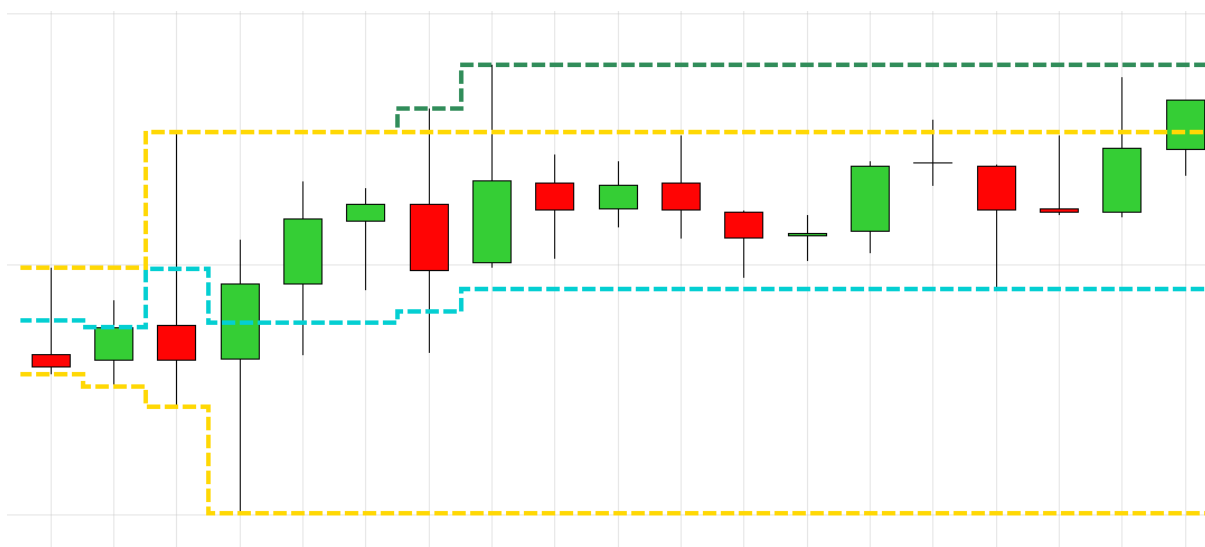
An example of a Normal day (15 min Candlestick chart)

NORMAL VARIATION DAY

In a **Normal Variation Day**, the Maximum Range extension is 2 x Initial Balance.
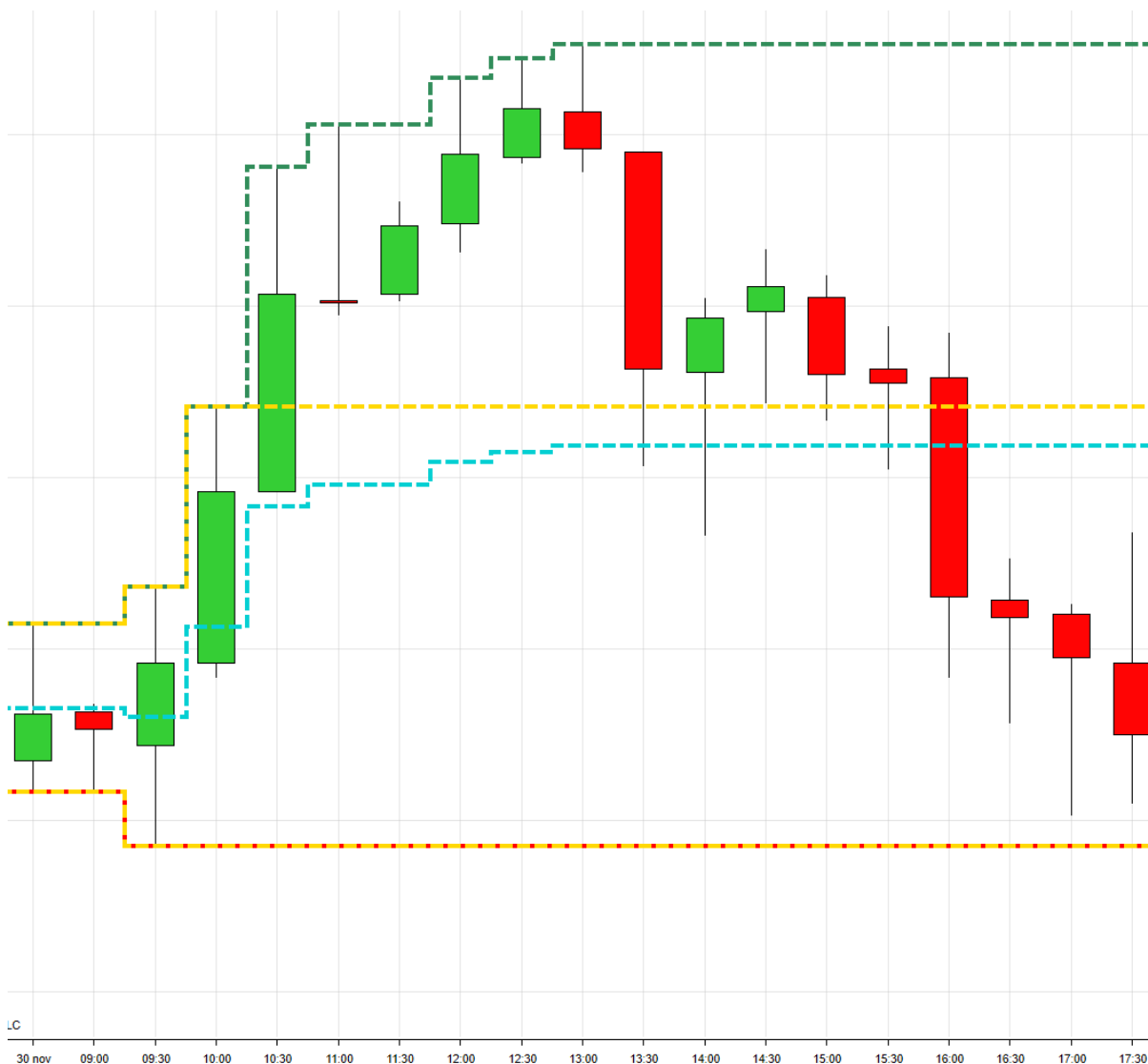
An example of a Normal Variation day (15 min Candlestick chart)

TREND DAY

A **Trend day** is defined when market participants extend the range beyond 2 x Initial Balance.
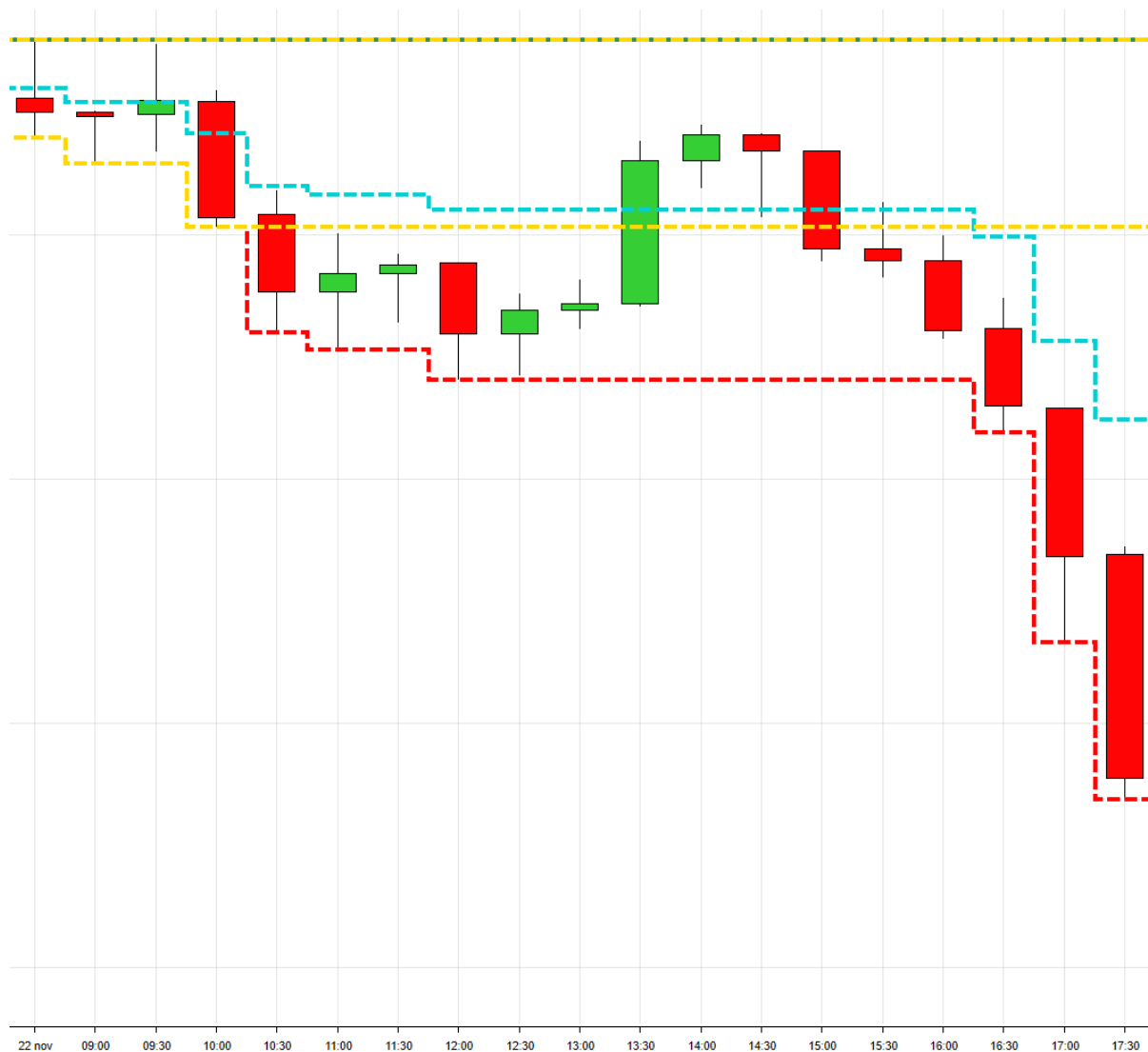
An example of a Trend day (15 min Candlestick chart)

NEUTRAL DAY

In a **Neutral Day**, both Initial Balance Low & High are broken
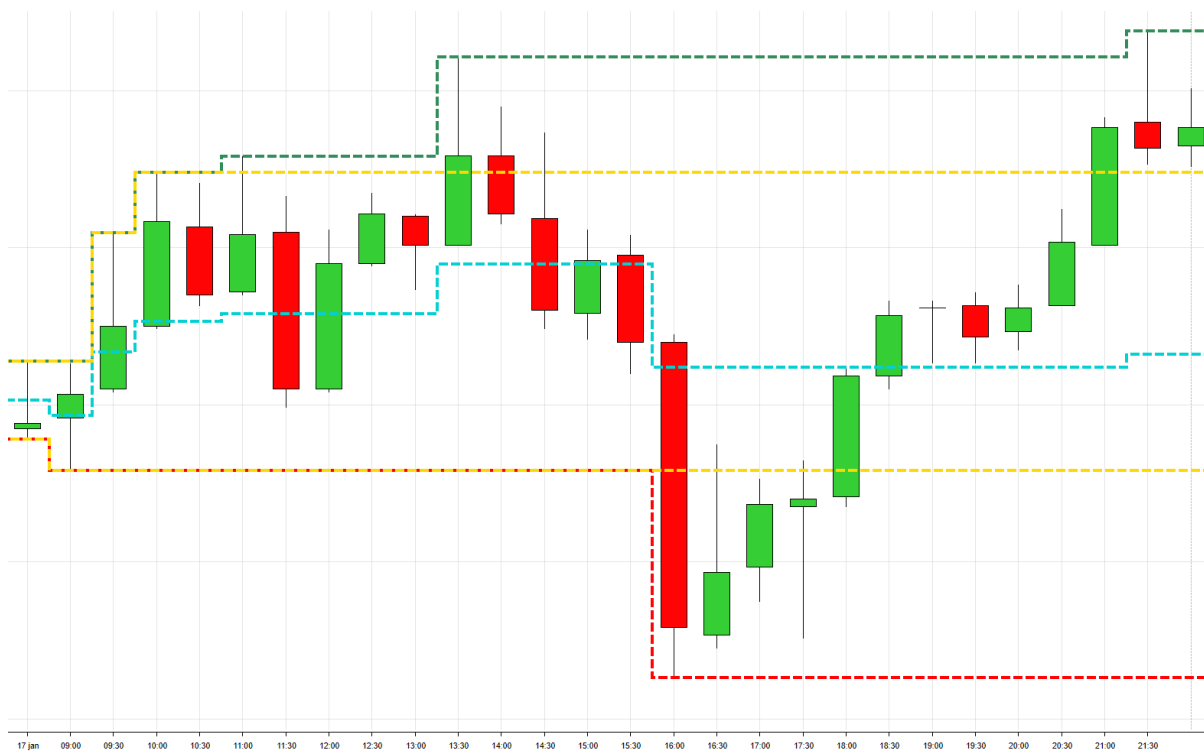
An example of a Neutral day (15 min Candlestick chart)

HISTORICAL PROBABILITIES

Daytypes Historical Probabilities
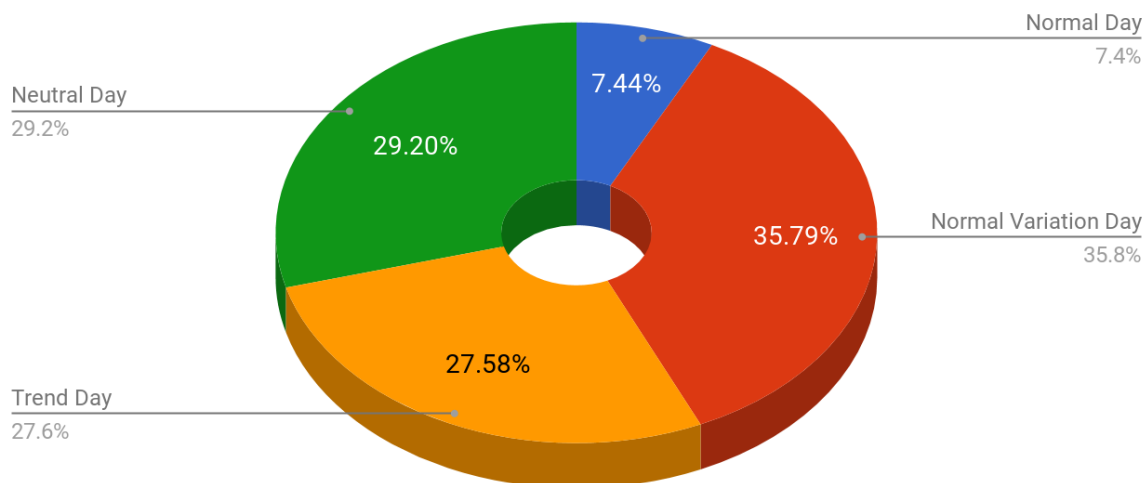
Normal Day
7.44%

Neutral Day
29.2%

Normal Day
7.4%

29.20%

35.79%

Normal Variation Day
35.8%

Trend Day
27.6%

27.58%

Normal Day		7.44%
Normal Variation Day		35.79%
Trend Day		27.58%
Neutral Day		29.20%
Samples		1291

HISTORICAL PROBABILITIES FOR EACH WEEKDAY

Daytypes Historical Probablity for each weekday
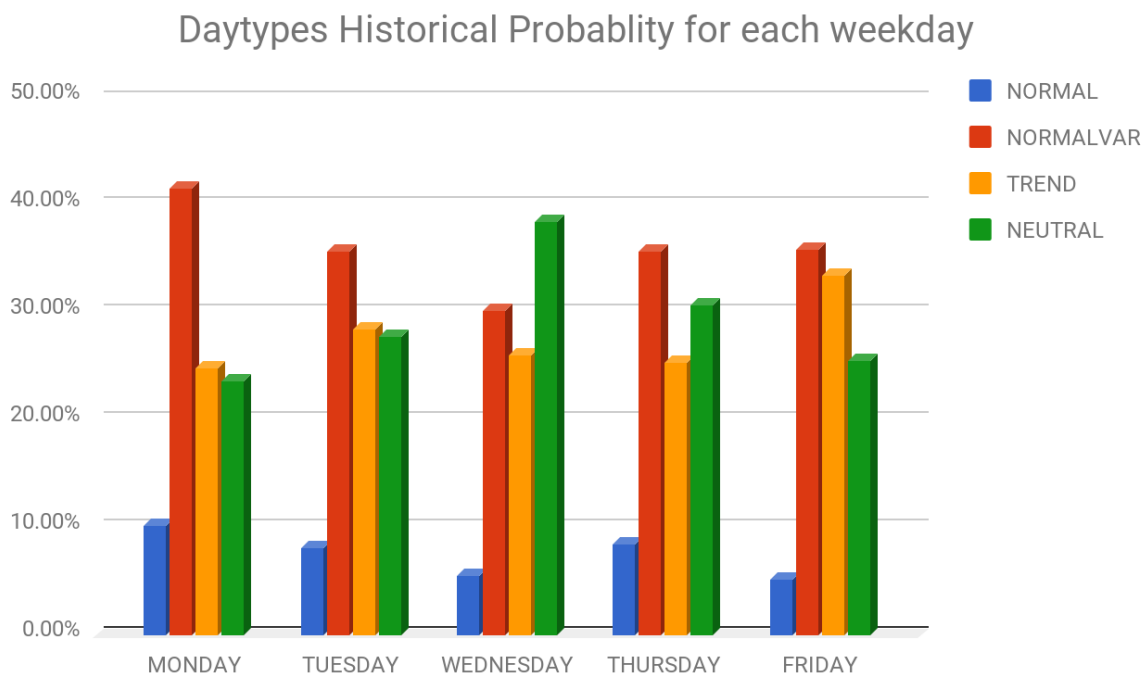
DAY	NORMAL	NORMALVAR	TREND	NEUTRAL	SAMPLES
MONDAY	10.08%	41.47%	24.81%	23.64%	258
TUESDAY	8.08%	35.77%	28.46%	27.69%	260
WEDNESDAY	5.43%	30.23%	25.97%	38.37%	258
THURSDAY	8.43%	35.63%	25.29%	30.65%	261
FRIDAY	5.12%	35.83%	33.46%	25.59%	254

OVERNIGHT STATS

The Overnight High and Low provide relevant reference points, which can provide additional context, next to potential opportunities.
The OVN High and Low are set between the Session End and the Start of the next Session.
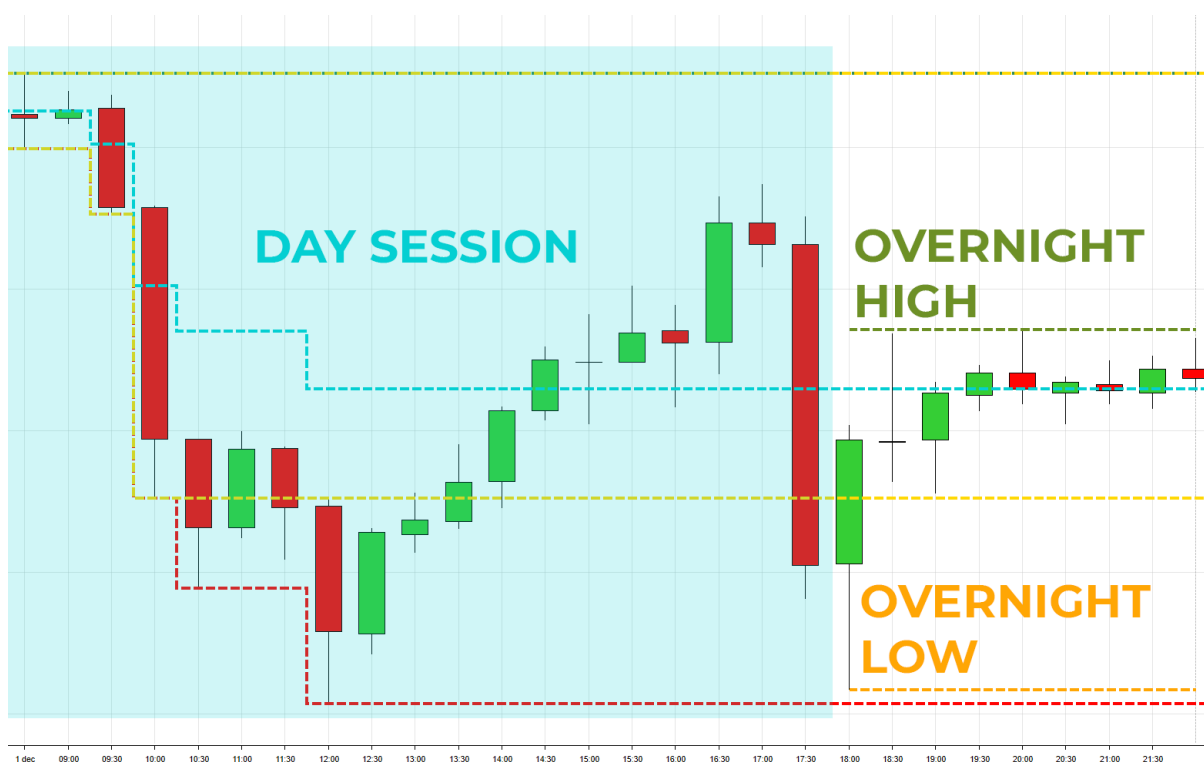
The Overnight High is represented by the Olive dashed line, the Overnight Low by the Orange dashed line (15 min Candlestick chart)

HISTORICAL PROBABILITIES

Overnight High / Low Break - Historical Probabilities
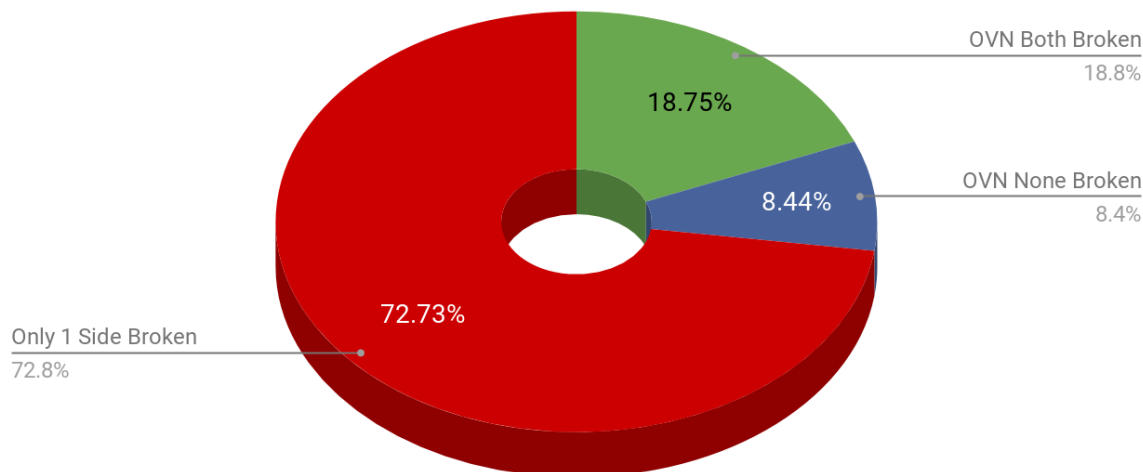
- OVN Both Broken — 18.75% — 18.8%
- OVN None Broken — 8.44% — 8.4%
- Only 1 Side Broken — 72.73% — 72.8%

OVN Both Broken		18.75%
OVN None Broken		8.44%
Only 1 Side Broken		72.73%
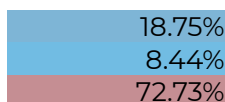
Overnight High / Low Historical Probabilities
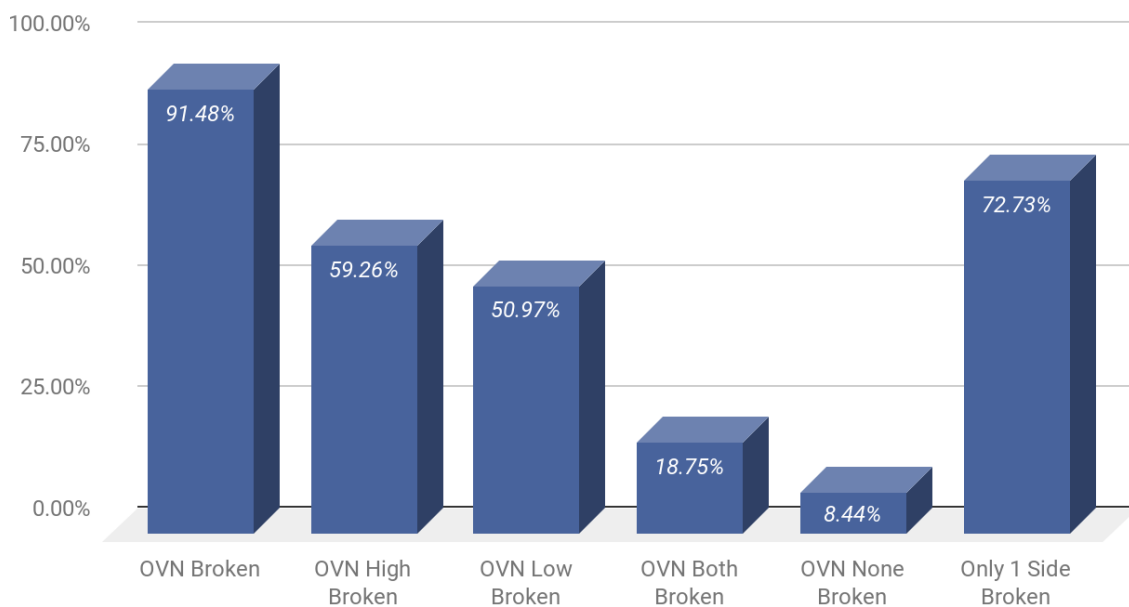
	Value
OVN Broken	91.48%
OVN High Broken	59.26%
OVN Low Broken	50.97%
OVN Both Broken	18.75%
OVN None Broken	8.44%
Only 1 Side Broken	72.73%
Samples	1291

OVN Broken: either the OVN High or Low were broken during RTH (regular trading hours)

OVN High Broken: OVN High was broken during RTH

OVN Low Broken: OVN Low was broken during RTH

OVN Both Broken: OVN High & Low were broken during RTH

OVN None Broken: The RTH range remained within the OVN range

Only 1 Side Broken: Only the OVN High or Low was broken during RTH

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OPENING STATS

In this section we evaluate the Opening Price of the Session compared to the prior Session. We calculate the historical probabilities of certain levels of the prior Session to be tested. Prior session refers to the prior RTH (Regular Trading Hours) session.

OPENING PRICE COMPARED TO PRIOR SESSION

Opening Price compared to Prior Session - Historical Probabilities
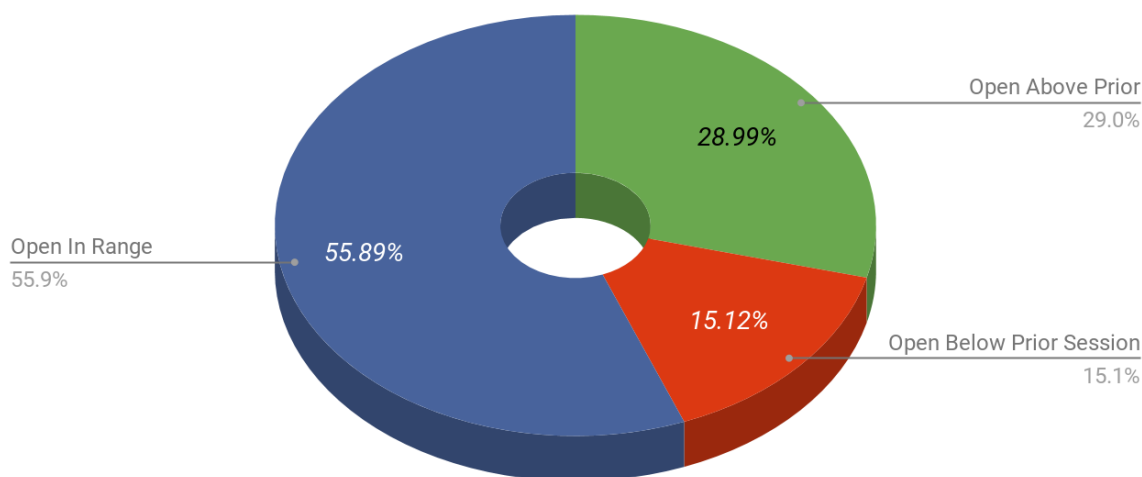
Open Above Prior
29.0%

28.99%

Open In Range
55.9%

55.89%

15.12%

Open Below Prior Session
15.1%

Open Above Prior Session		28.99%
Open Below Prior Session		15.12%
Open In Range		55.89%
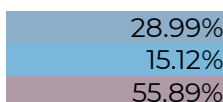
OPEN ABOVE PRIOR SESSION (GAP UP)

In this Scenario, the Session Opening price is higher than the Prior Session High.

Open ABOVE Prior Session - Historical Probabilities
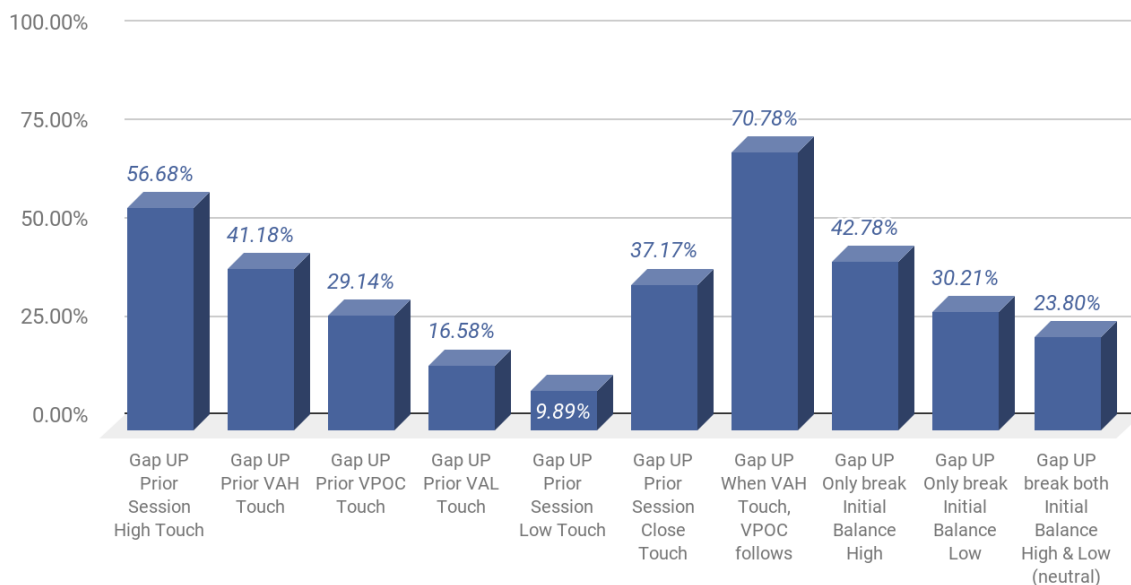
Gap UP Prior Session High Touch	56.68%
Gap UP Prior VAH Touch	41.18%
Gap UP Prior VPOC Touch	29.14%
Gap UP Prior VAL Touch	16.58%
Gap UP Prior Session Low Touch	9.89%
Gap UP Prior Session Close Touch	37.17%
Gap UP When VAH Touch, VPOC follows	70.78%
Gap UP Only break Initial Balance High	42.78%
Gap UP Only break Initial Balance Low	30.21%
Gap UP break both Initial Balance High & Low (neutral)	23.80%

VAH: Value Area High

VAL: Value Area Low

VPOC: Volume Point of Control (most traded price)

OPEN BELOW PRIOR SESSION (GAP DOWN)

In this Scenario, the Session Opening price is lower than the Prior Session Low.

Open BELOW Prior Session - Historical Probabilities
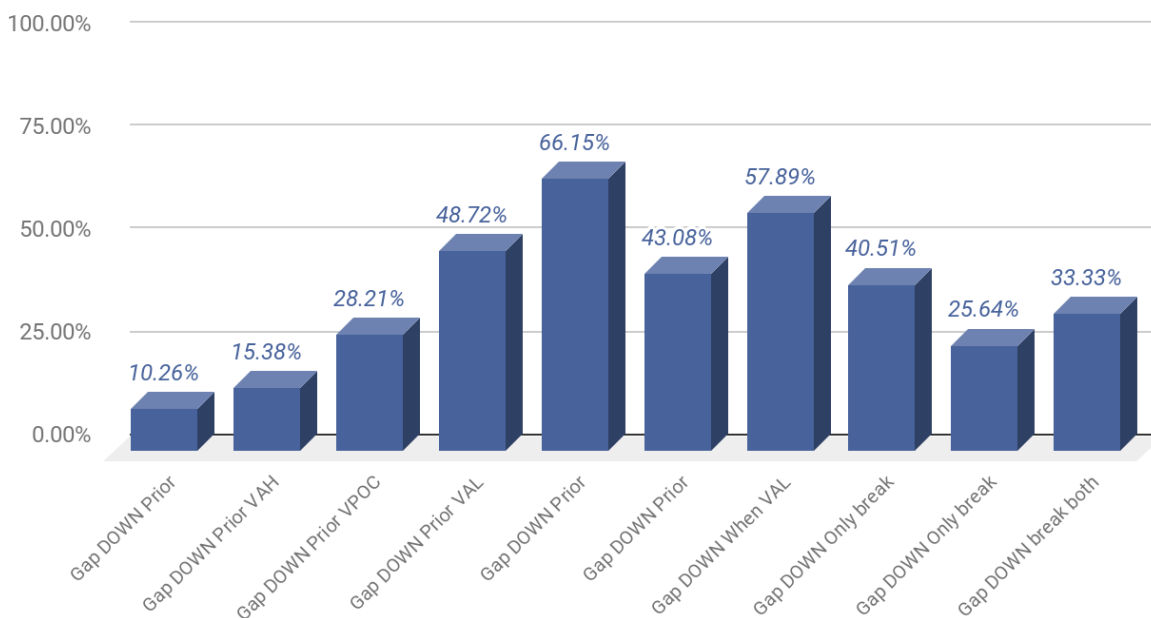
Gap DOWN Prior Session High Touch	10.26%
Gap DOWN Prior VAH Touch	15.38%
Gap DOWN Prior VPOC Touch	28.21%
Gap DOWN Prior VAL Touch	48.72%
Gap DOWN Prior Session Low Touch	66.15%
Gap DOWN Prior Session Close Touch	43.08%
Gap DOWN When VAL Touch, VPOC follows	57.89%
Gap DOWN Only break Initial Balance High	40.51%
Gap DOWN Only break Initial Balance Low	25.64%
Gap DOWN break both Initial Balance High & Low (neutral)	33.33%

OPEN WITHIN PRIOR SESSION RANGE

In this Scenario, the Session Opening price is between the Prior Session High and Low.

Open in Prior Session Range - Historical Probabilities
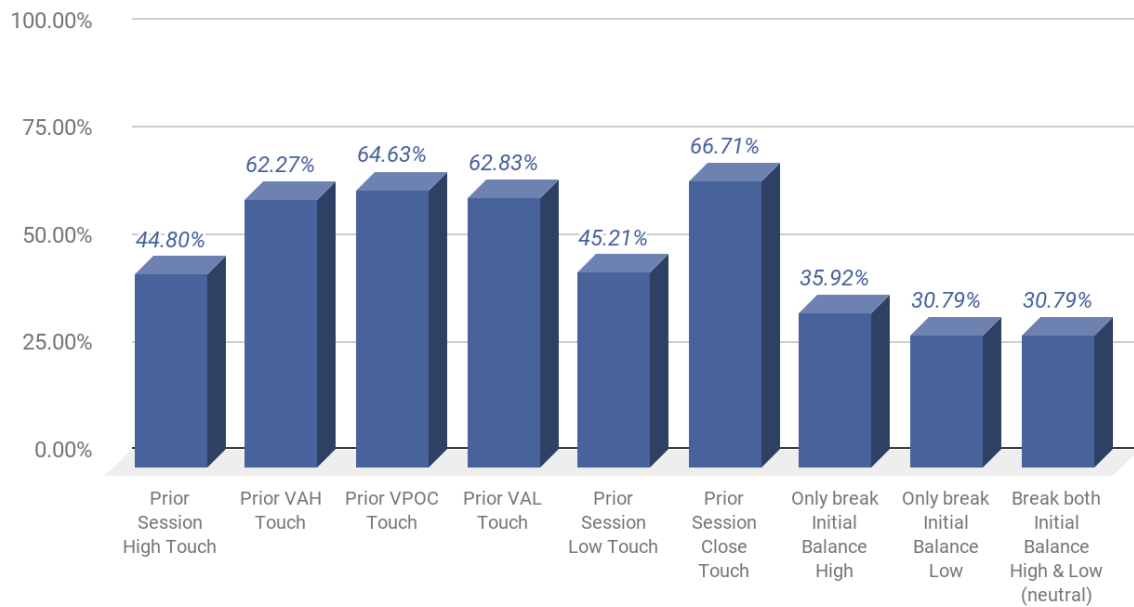
Prior Session High Touch	44.80%
Prior VAH Touch	62.27%
Prior VPOC Touch	64.63%
Prior VAL Touch	62.83%
Prior Session Low Touch	45.21%
Prior Session Close Touch	66.71%
Only break Initial Balance High	35.92%
Only break Initial Balance Low	30.79%
Break both Initial Balance High & Low (neutral)	30.79%

OPENING PRICE COMPARED TO PRIOR VALUE AREA

In this section, the Opening Price is within the Prior Session Range. We want to evaluate how the statistical probabilities are influenced by the Opening Price relation to the Prior Session Value Area.

The **Value Area** is a Market Profile concept. This is an area demarcated by 2 prices which bound the "most traded in" part of a time period. Technically the value area is 1 standard deviation away from the most traded at price which is the price which has the highest volume (VPOC = Volume Point of Control). The boundaries of this Area are called the **Value Area High** (VAH) and **Value Area Low** (VAL)
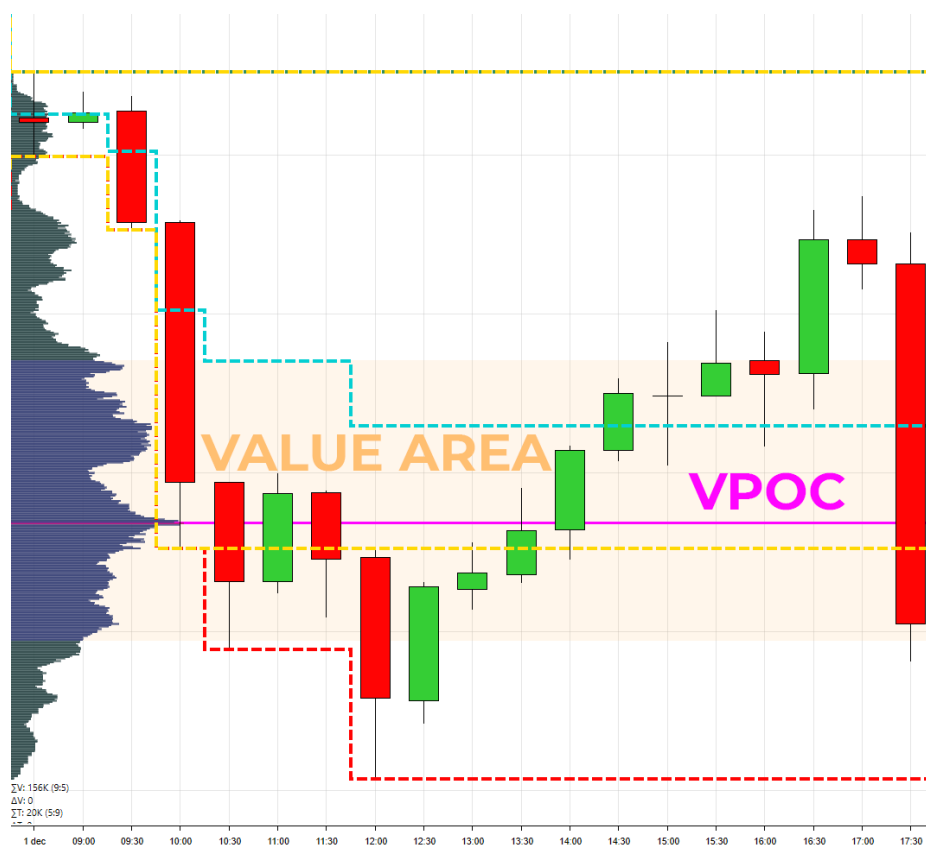
The Value Area is the Orange colored area, the Volume Point of Control (VPOC) is represented by the Purple line (15 min Candlestick chart)

Opening Price compared to Prior Session Value Area- Historical

Open In Range, Above
20.9%

11.86%

Open In Range, Below
20.7%

11.71%

Open In Range, In Value
58.4%
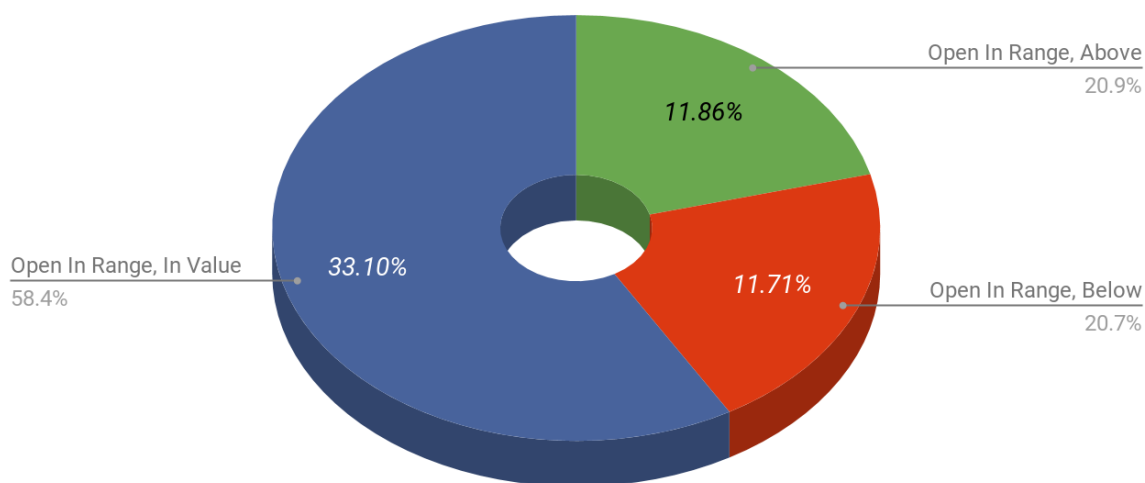
33.10%

Open In Range, Above Value Area (IRAV)	11.86%
Open In Range, Below Value Area (IRBV)	11.71%
Open In Range, In Value	33.10%

Note that these statistics further break down scenario's found within "Open within Prior Session", from the prior section of this document.

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OPEN IN RANGE, ABOVE PRIOR VALUE AREA

In this Scenario, the Session Opening price is within the Prior Session Range, but above the Prior Value Area.

Open In Range, ABOVE Prior Value Area- Historical Probabilities

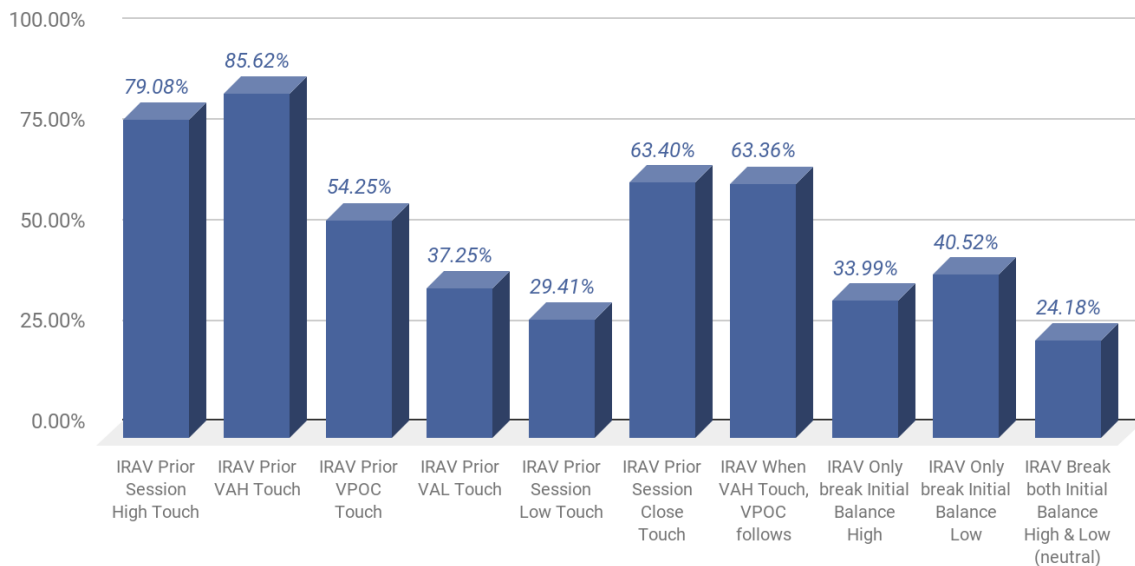|	
IRAV Prior Session High Touch	79.08%
IRAV Prior VAH Touch	85.62%
IRAV Prior VPOC Touch	54.25%
IRAV Prior VAL Touch	37.25%
IRAV Prior Session Low Touch	29.41%
IRAV Prior Session Close Touch	63.40%
IRAV When VAH Touch, VPOC follows	63.36%
IRAV Only break Initial Balance High	33.99%
IRAV Only break Initial Balance Low	40.52%
IRAV Break both Initial Balance High & Low (neutral)	24.18%
Samples	153 out of 1291

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OPEN IN RANGE, BELOW PRIOR VALUE AREA

In this Scenario, the Session Opening price is within the Prior Session Range, but below the Prior Value Area.

Open In Range, BELOW Prior Value Area- Historical Probabilities
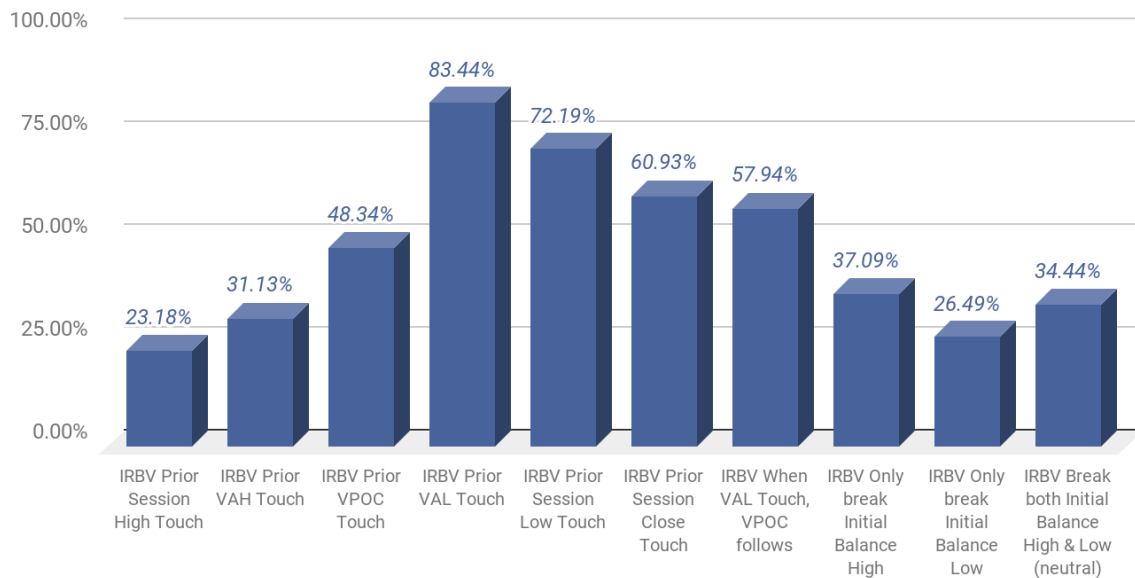
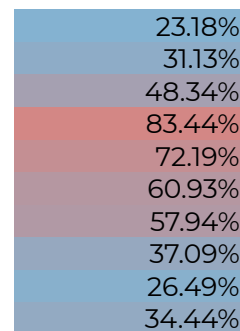|	
IRBV Prior Session High Touch	23.18%
IRBV Prior VAH Touch	31.13%
IRBV Prior VPOC Touch	48.34%
IRBV Prior VAL Touch	83.44%
IRBV Prior Session Low Touch	72.19%
IRBV Prior Session Close Touch	60.93%
IRBV When VAL Touch, VPOC follows	57.94%
IRBV Only break Initial Balance High	37.09%
IRBV Only break Initial Balance Low	26.49%
IRBV Break both Initial Balance High & Low (neutral)	34.44%
Samples	151 out of 1291

OPEN IN RANGE, WITHIN PRIOR VALUE AREA

In this Scenario, the Session Opening price is within the Prior Session Range, and within the Prior Value Area.

Open In Range, In Prior Value Area- Historical Probabilities

Prior Session High Touch	39.81%
Prior VAH Touch	65.57%
Prior VPOC Touch	72.83%
Prior VAL Touch	63.47%
Prior Session Low Touch	40.52%
Prior Session Close Touch	69.09%
Only break Initial Balance High	36.53%
Only break Initial Balance Low	28.10%
Break both Initial Balance High & Low (neutral)	32.32%
Samples	427 out of 1291

VOLUME STATS

In these statistics we analyze the Volume of the Session and Overnight across all samples (=RTH Sessions).

SESSION VOLUME DISTRIBUTION

Most Common Volume (POC)	908056	
Average Volume	**1113528.5**	
Standard Deviation	725656.74	
Normal Range (1 STD Dev)	387,872to	1839185.24
Samples	1,291	

OVERNIGHT VOLUME DISTRIBUTION

Most Common Volume (POC)	259073	
Average Volume	**319646.97**	
Standard Deviation	256483.01	
Normal Range (1 STD Dev)	63163.96to	576129.98
Samples	1,291.00	

ROTATIONS

Rotations are the **eb and flow** of the market on the **1 minute timeframe**. All the Sessions 1 minute data was analyzed for these statistics. A low is identified when the lowest price of one candle was lower than the lowest price of the prior 2 and subsequent 2 candles. It is calculated similarly for the High prices.

To illustrate this, examine the following chart

The Green Arrows represent an Up Rotation while the Red Arrow represents a Down Rotation. The Blue circles are the Highs and Lows identified using this method (1 min Candlestick chart)

In the sections below, we separately examine the **Up Rotations** and the **Down Rotations**. Using all samples (all rotations that happened during all

sessions) we create a distribution chart, showing us what the **common and outlier rotations** are.

UP ROTATIONS DISTRIBUTION

Most Common Range (POC)	**0.75**
Average Range	**2.78**
Standard Deviation	3.69
Normal Range (1 STD Dev)	-0.91to **6.47**
Samples	69,788.00

📎 To view the Distribution Chart, please refer to the attachments that came with this report.

DOWN ROTATIONS DISTRIBUTION

Most Common Range (POC)	**-0.75**		
Average Range	**-2.78**		
Standard Deviation	3.73		
Normal Range (1 STD Dev)	**-6.51**	to	0.95
Samples	69839		

📎 To view the Distribution Chart, please refer to the attachments that came with this report.

VPOC BASED STATS

In this section we evaluate the location of the VPOC (Volume Point of Control - most traded price) during a specific time.

VPOC LOCATION LINK TO INITIAL BALANCE BREAK

These probabilities are calculated by evaluating the location of the **VPOC at the time the Initial Balance is completed**.

Initial Balance VPOC above Mid, Chance to Break Initial Balance High

70.34%

Samples 708 out of 1291

Initial Balance VPOC below Mid, Chance to Break Initial Balance Low

62.00%

Samples 550 out of 1291

VPOC LOCATION LINK TO NEXT SESSION

These probabilities are calculated by evaluating the location of the **VPOC at the time of the RTH Session Close**.

When Session VPOC is in the Top 25% of the Session Range
- Probability of next Session VPOC to be lower than prior Session VPOC

59.53%

- Probability of next Session to break the prior Session High

40.47%

Samples 257 out of 1291

When Session VPOC is in the Bottom 25% of the Session Range
- Probability of next Session VPOC to be higher than prior Session VPOC

67.31%

- Probability of next Session to break the prior Session Low
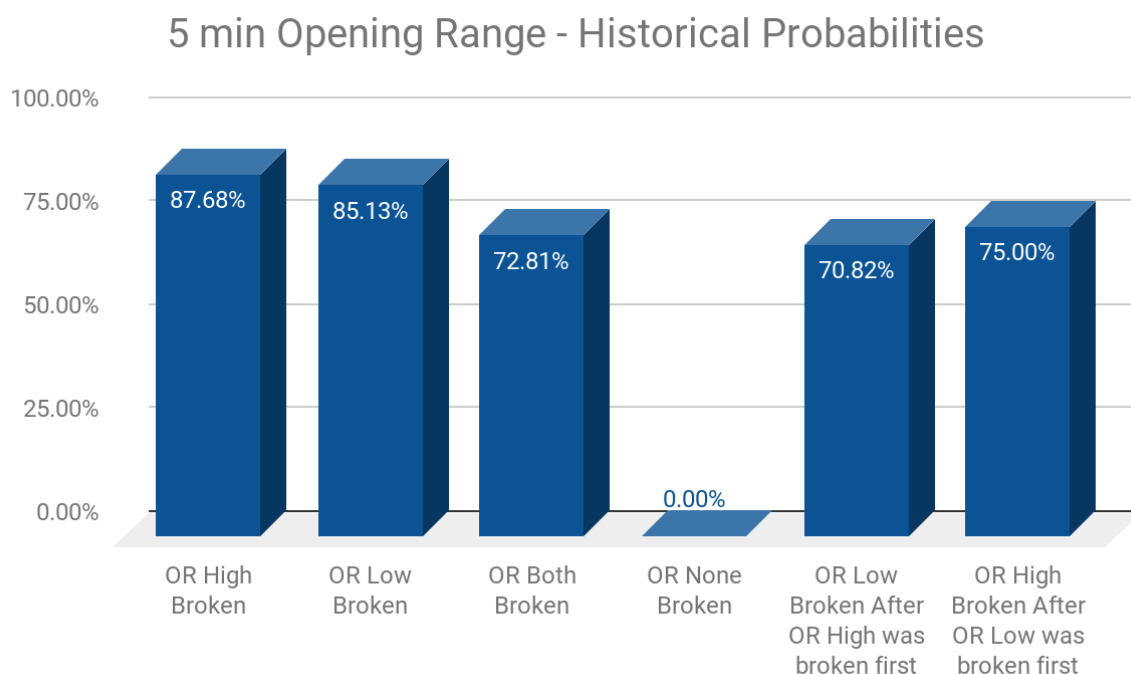
40.38%

Samples 104 out of 1291

OPENING RANGE STATS

These statistics are calculated for a time based 5 minute opening range.

OPENING RANGE HISTORICAL PROBABILITIES

5 min Opening Range - Historical Probabilities

Category	Value
OR High Broken	87.68%
OR Low Broken	85.13%
OR Both Broken	72.81%
OR None Broken	0.00%
OR Low Broken After OR High was broken first	70.82%
OR High Broken After OR Low was broken first	75.00%
Samples	1291

OPENING RANGE DISTRIBUTION

Most Common Range (POC)	**3**	
Average Range	**5.18**	
Standard Deviation	5.76	
Normal Range (1 STD Dev)	-0.58to	10.94
Samples	1291	

> 📎 To view the Distribution Chart, please refer to the attachments that came with this report.