

# Creating new strategy using API version 2.0



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## Introduction

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- **History:** Started in **2011** from India
- **Mission:** **Enabling Smarter Trading**
- **Target Clients:** Capital markets participants including brokers, HFT firms, proprietary traders, banks and other financial institutions
- **Products:** **Algorithmic trading, Trading Platform and Portfolio Analytics products**
- **Technology:** Based on **Open Source technologies**, developed from scratch, C/C++/Python/HTML5 programming languages, and modular architecture; **6 patents filed in India, and 1 patent filed in US/UK to lead innovation**
- **Recognition:** Shortlisted in **London Fintech Innovation Labs** program 2014 and Indian Industry organizations including **CII & Nasscom** as most innovative and top 50 emerging Indian companies for year 2013

## Design Front-end

Design front end using utrade design toolbox. Choose and model parameters according to your needs. Choose label name wisely as same will be used to get values from backend.

API Form Design Tool

Leg	Instrument	Order Mode
<input checked="" type="checkbox"/> Leg 1	Future	Buy
<input checked="" type="checkbox"/> Leg 2	Stock	Sell
<input type="checkbox"/> Leg 3	Stock	Buy
<input type="checkbox"/> Leg 4	Stock	Buy

**ToolBox**

- ☒ Radio Button
- ☒ Check Box
- Qty Spin Box
- Price Spin Box
- Spin Box
- Double Spin Box
- Combo Box
- Date/Time
- SEPARATOR**
- STRETCH**

**Strategy Params**

- Qty Spin Box
- Qty Spin Box
- Price Spin Box
- Combo Box
- SEPARATOR**
- Date/Time
- ☐ Radio Button
- STRETCH**
- ☒ Check Box
- STRETCH**

**Properties**

Label 
 Min Val 
 Max Val 
 Def Val

## Download front end script and embed in backend strategy code

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use linux command `xxd -i <parameters_frontfile>`,

This will convert text into embeddable code

create a function

```
extern "C" std::string getFrontEndDesign();
```

to return this design

## xxd- i params.txt

```
unsigned char param_txt[] =
{
    0x5b, 0x53, 0x59, 0x4d, 0x42, 0x4f, 0x4c, 0x5d, 0x0a, 0x53, 0x59, 0x4d, 0x42,
    0x4f, 0x4c, 0x20, 0x4c, 0x45, 0x47, 0x31, 0x4e, 0x54, 0x36, 0x34, 0x0a, 0x4f,
    0x72, 0x64, 0x65, 0x72, 0x20, 0x4d, 0x6f, 0x64, 0x65, 0x20, 0x31, 0x3d, 0x55,
    0x43, 0x0a, 0x53, 0x59, 0x4d, 0x42, 0x4f, 0x4c, 0x20, 0x4c, 0x45, 0x47,
    0x32, 0x3d, 0x55, 0x49, 0x4e, 0x54, 0x36, 0x34, 0x0a, 0x73, 0x74, 0x20, 0x42,
    0x69, 0x64, 0x2f, 0x41, 0x73, 0x6b, 0x3a, 0x42, 0x65, 0x73, 0x74, 0x20, 0x41,
    0x73, 0x6b, 0x2f, 0x0a, 0x53, 0x45, 0x50, 0x41, 0x52, 0x41, 0x54, 0x4f, 0x52,
    0x3d, 0x31, 0x0a, 0x54, 0x69, 0x6d, 0x65, 0x72, 0x3d, 0x54 0x52, 0x0a, 0x53,
    0x70, 0x72, 0x65, 0x61, 0x64, 0x20, 0x54, 0x79, 0x70, 0x65, 0x3d, 0x52, 0x41,
    0x44, 0x49, 0x4f, 0x3a, 0x64, 0x75, 0x63, 0x74, 0x3a, 0x41, 0x63, 0x74, 0x75,
    0x61, 0x6c, 0x3a, 0x41, 0x63, 0x74, 0x75, 0x61, 0x6c, 0x0a, 0x530x54, 0x43,
    0x48, 0x3d, 0x31, 0x0a, 0x43, 0x68, 0x6b, 0x20, 0x53, 0x70, 0x72, 0x65, 0x61,
    0x64, 0x3d, 0x42, 0x4f, 0x4f, 0x54, 0x52, 0x45, 0x54, 0x43, 0x48, 0x3d,
    0x31, 0x0a, 0x42, 0x69, 0x64, 0x20, 0x44, 0x69, 0x66, 0x66, 0x3d, 0x42, 0x4f,
    0x0a, 0x5b, 0x4f, 0x54, 0x48, 0x45, 0x52, 0x5d, 0x20, 0x20, 0x0a
};

unsigned int param_txt_len = 425;
```

## Corresponding embedded code

```
extern "C"  
std::string getFrontEndDesign()  
{  
    const char param_txt[] =  
    {  
        0x5b, 0x53, 0x59, 0x4d, 0x42, 0x4f, 0x4c, 0x5d, 0x0a, 0x53, 0x59, 0x4d,  
        0x42, 0x4f, 0x4c, 0x20, 0x4c, 0x45, 0x47, 0x31, 0x3d, 0x55, 0x49, 0x4e,  
        0x54, 0x36, 0x34, 0x0a, 0x4f, 0x72, 0x64, 0x65, 0x72, 0x20, 0x4d, 0x6f,  
        0x64, 0x65, 0x20, 0x31, 0x3d, 0x55, 0x43, 0x48, 0x41, 0x52, 0x0a, 0x53,  
        0x59, 0x4d, 0x42, 0x4f, 0x4c, 0x20, 0x4c, 0x45, 0x47, 0x32, 0x3d, 0x55,  
        0x49, 0x4e, 0x54, 0x36, 0x34, 0x0a, 0x4f, 0x72, 0x64, 0x65, 0x72, 0x20,  
        0x4d, 0x6f, 0x64, 0x65, 0x20, 0x32, 0x3d, 0x55, 0x43, 0x48, 0x41, 0x52,  
        0x0a, 0x23, 0x53, 0x59, 0x4d, 0x42, 0x4f, 0x4c, 0x20, 0x4c, 0x45, 0x47,  
        0x33, 0x3d, 0x550x0a  
    };  
  
    unsigned int param_txt_len = 425;  
    return std::string(param_txt,param_txt_len);  
}
```

## Create getDriver function

---

create a function

```
extern "C"  
void * getDriver(void * params)
```

this function will be the entry point for your strategy.

Here you create an object of your strategy class and start your algo

## Sample getDriver function

```
extern "C"  
void *getDriver(void *params)  
{  
    API2::StrategyParameters *sgParams = API2::StrategyParameters*)params;  
    SampleStrategy context(sgParams);  
    return context.reqStartAlgo(true); // Market event required  
    //return context.reqStartAlgo(false); // Market event not required  
}
```

## Creating strategy class

All strategy need to be derived from `API2::SGContext` class

This class has predefined functionality to send order and receive market data & virtual functions which user can override.

## Sample Strategy Class

```
class SampleStrategy : public API2::SGContext
{
    public :
    Context(API2::StrategyParameters *params);
    //overridden void OnCMDModifyStrategy(API2::AbstractUserParams*);
    private:
    SIGNED_LONG _symbolid;
    //will be set by front end parameters
    API2::SGCommon::InstrumentOrderId *_instrumentOrderId;
    //used to uniquely identify order
    API2::COMMON::Instrument *_instrument;
    //used in market data subscription , sending orders
    // and p&l calculation
};
```



## Things to do in Constructor

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- > setup log file using Base class constructor
- > read front end parameters

```
SampleStrategy(API2::StrategyParameters *params):  
API2::SGContext(params, "SampleStrategy") // Sample strategy log file created  
{  
    API2::UserParams *frontendParams = (API2::UserParams *)params->getInfo();  
    //Parameters received from frontend  
  
    //reading parameters  
  
    if(frontendParams->getValue("SYMBOL LEG1",_symbolid) !=  
API2::UserParamsError_OK)  
    {  
        std::cout<<"Error in getting SYMBOL LEG1"<<std::endl;  
    }  
}
```

## Subscribing Market order and setting up instrument

```
_instrument = createNewInstrument(  
//sending by reference will be set internally_symbolId,  
//will be used for creating instrument true,  
//need to register for feed or not false);  
//feed type false for TBT feed or true for snapshot feed
```

## Receiving mkt event

if ReqStartAlgo funtion is with market event enabled then feed event will be received by overriding OnMarketDataEvent

```
void SampleStrategy::onMarketDataEvent(UNSIGNED_LONG symbolid)  
{  
    std::cout<<"Symbol id Market Data "  
    <<symbolid  
    <<std::endl;  
    API2::COMMON::MktData *mkData = reqQryUpdateMarketData(symbolid);  
    mkData->dump();  
}
```

## Sending Orders

```
API2::SingleOrder *order;
API2::DATA_TYPES::RiskStatus riskStatus = API2::CONSTANTS::RSP_RiskStatus_MAX;
order = createNewOrder(_instrument, <QTY>, <Revealed QTY>,
API2::CONSTANTS::CMD_OrderMode_BUY,
API2::CONSTANTS::CMD_OrderType_LIMIT,
API2::CONSTANTS::CMD_OrderValidity_DAY,
API2::CONSTANTS::CMD_ProductType_DELIVERY,
<PRICE>);_instrumentOrderId = NULL:
if( ! reqNewSingleOrder(riskStatus,_instrument,_order, _instrumentOrderId))
//_instrumentOrderId is used to uniquely identify an order
{
    //error in sending order
    //riskstatus variable will have error code store in it , describing the
    problem.
}
else
{
    //order sent out successfully
}
```

## Receiving Confirmations

---

SGContext class has many virtual functions such as

- onNewConfirmed
- onCanceled
- onReplaced
- onReplaceRejected
- onCancelRejected
- onNewReject
- onFilled
- onPartialFill

they need to be overridden to capture confirmations such as

```
void SampleStrategy::onConfirmed(API2::orderConfirmation &confirmation,  
API2::COMMON::InstrumentOrderId *orderId)  
{  
    if(orderId == _instrumentOrderId)  
    {  
        //confirmation received from exchange  
        //do something according ti your logic  
    }  
}
```

## Disclaimer

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