

Qt



# Atelier: Impressão 3D Powered by Qt

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# \$ whoami

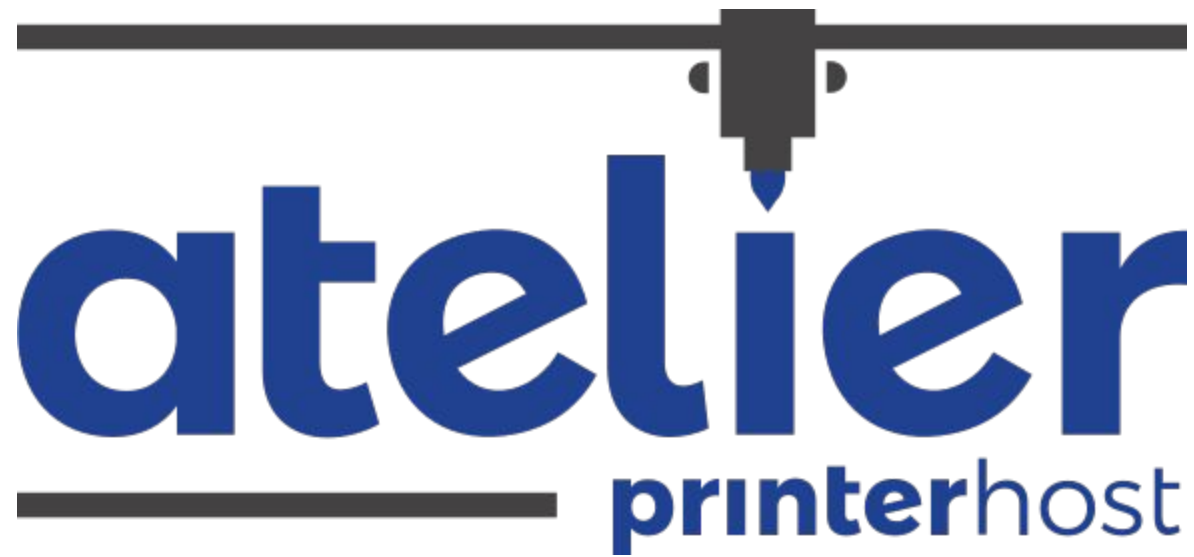


- KDE > 3 Anos
- Estagiária TV Globo ~ 2 Anos
- Palestrante > 2 Anos
- Sistemas de Informação UFF ~ 1.5 Anos

# Who we are

- Chris Rizzitello
- Lays Rodrigues
- Patrick Pereira
- Tomaz Canabrava





Arquitetura



**Biblioteca**

# Flexibilidade com Qt Plugins

## Interfaces + Plugin + QPluginLoader

# Interfaces

```
39     class ATCORE_EXPORT IFirmware : public QObject
40     {
41         Q_OBJECT
42         Q_PROPERTY(QString name READ name)
43         Q_PROPERTY(bool sdSupport READ isSdSupported)
44     public:
45         IFirmware();
46         void init(AtCore *parent);
47         ~IFirmware() override;
```

src: <https://github.com/KDE/atcore/blob/master/src/core/ifirmware.h>



# Definição do Plugin

```
34     class MarlinPlugin : public IFirmware
35     {
36         Q_OBJECT
37         Q_PLUGIN_METADATA(IID "org.kde.atelier.core.firmware")
38         Q_INTERFACES(IFirmware)
39     }
```



# QPluginLoader

```
184 void AtCore::loadFirmwarePlugin(const QString &fwName)
185 {
186     qCDebug(ATCORE_CORE) << "Loading plugin: " << d->plugins[fwName];
187     if (d->plugins.contains(fwName)) {
188         d->pluginLoader.setFileName(d->plugins[fwName]);
189         if (!d->pluginLoader.load()) {
190             //Plugin was not loaded, Provide some debug info.
191             qCDebug(ATCORE_CORE) << "Plugin Loading: Failed.";
192             qCDebug(ATCORE_CORE) << d->pluginLoader.errorString();
193             setState(AtCore::STATES::CONNECTING);
```



# O que ganhamos ?

- Flexibilidade na criação de Plugins
- Fácil adaptação aos firmwares
  - ◆ Firmwares OpenSource
  - ◆ Firmwares Proprietários
- Portabilidade

# Interface Serial - QSerial

# SerialLayer

```
32  /**
33   * @brief The SerialLayer class.
34   * Provide the low level serial operations
35   */
36  class ATCORE_EXPORT SerialLayer : public QSerialPort
37  {
38      Q_OBJECT
39
40  private:
41      class SerialLayerPrivate;
42      SerialLayerPrivate *d;
43
44      /**
45       * @brief Read all available serial data
46       *
47       */
48      void readAllData();
```

src: <https://github.com/KDE/atcore/blob/master/src/core/seriallayer.h>

```
56 class SerialLayer::SerialLayerPrivate
57 {
58 public:
59     bool _serialOpened;          //!< @param _serialOpened: is serial port opened
60     QSerialPort::SerialPortError _lastError; //!< @param _lastError: the last reported error
61     QByteArray _rawData;        //!< @param _rawData: the raw serial data
62     QVector<QByteArray> _rByteCommands; //!< @param _rByteCommand: received Messages
63     QVector<QByteArray> _sByteCommands; //!< @param _sByteCommand: sent Messages
64 };
```

# Impressão de um Arquivo - QThread

# PrintThread

```
35 class PrintThread::PrintThreadPrivate
36 {
37 public:
38     AtCore *core = nullptr;           //!<@param core: Pointer to AtCore
39     QTextStream *gcodestream = nullptr; //!<@param gcodestream: Steam the job is read from
40     float printProgress = 0;         //!<@param printProgress: Progress of the print job
41     qint64 totalSize = 0;             //!<@param totalSize: total file size
42     qint64 stillSize = 0;            //!<@param stillSize: remaining file
43     QString cline;                   //!<@param cline: current line
44     AtCore::STATES state = AtCore::IDLE; //!<@param state: printer state
45     QFile *file = nullptr;           //!<@param file: gcode File to stream from
46     QList<QCommandLineOption> options = {
47         {QCommandLineOption(QStringLiteral("pause"))},
48         {QCommandLineOption(QStringLiteral("extruder temperature"))},
49         {QCommandLineOption(QStringLiteral("bed temperature"))},
50         {QCommandLineOption(QStringLiteral("print speed"))},
51         {QCommandLineOption(QStringLiteral("fan speed"))},
52         {QCommandLineOption(QStringLiteral("flow rate"))},
53         {QCommandLineOption(QStringLiteral("message"))},
54         {QCommandLineOption(QStringLiteral("command"))}
55     }; //!<@param options: injectable commands.
56 };
```

src: <https://github.com/KDE/atcore/blob/master/src/core/printthread.cpp>

# The Thread

```
365     QThread *thread = new QThread();
366     PrintThread *printThread = new PrintThread(this, fileName);
367     printThread->moveToThread(thread);
368
369     connect(printThread, &PrintThread::printProgressChanged, this,
370            &AtCore::printProgressChanged, Qt::QueuedConnection);
371     connect(thread, &QThread::started, printThread, &PrintThread::start);
372     connect(printThread, &PrintThread::finished, thread, &QThread::quit);
373     connect(thread, &QThread::finished, printThread, &PrintThread::deleteLater);
374     if (!thread->isRunning()) {
375         thread->start();
376     }
377 }
```



# Print!

```
87     switch (d->state) {
88     case AtCore::STARTPRINT:
89     case AtCore::IDLE:
90     case AtCore::BUSY:
91         setState(AtCore::BUSY);
92         nextLine();
93         while (d->cline.isEmpty() && !d->gcodestream->atEnd()) {
94             nextLine();
95         }
96         if (!d->cline.isEmpty() && d->core->state() != AtCore::PAUSE) {
97             qDebug(PRINT_THREAD) << "cline:" << d->cline;
98             emit nextCommand(d->cline);
99         }
100        break;
101
```

src: <https://github.com/KDE/atcore/blob/master/src/core/printthread.cpp>

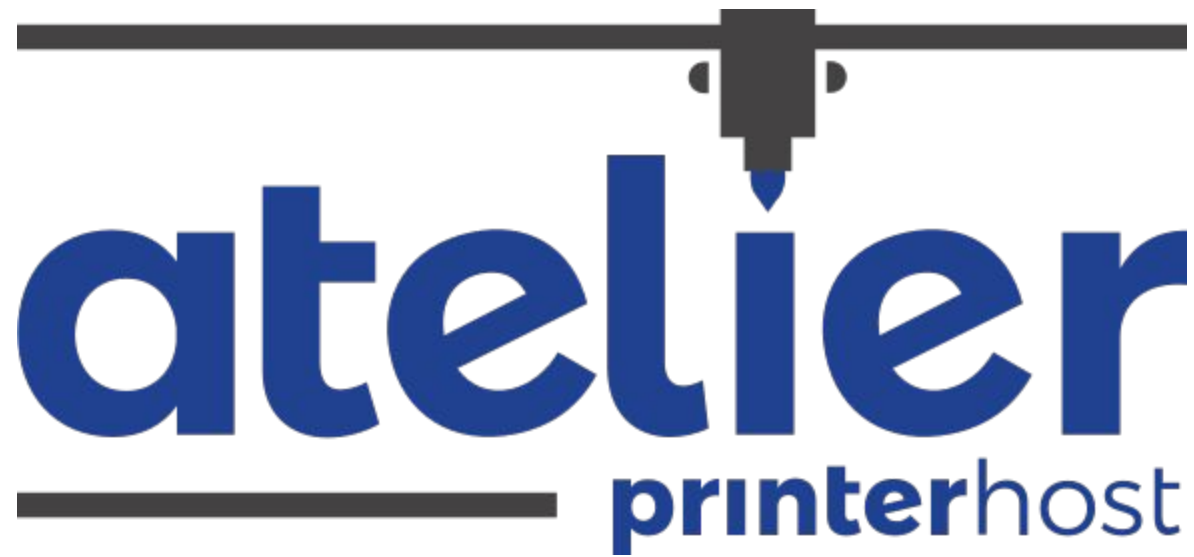
# Injection!

```
1  ;- Pause: G91, G0 Z1, G90, G1 X0 Y195
2  ;- Extruder Temperature:160,0,true (set temp of extruder 0 to 160 and wait)
3  ;- Bed Temperature: 80,true (set bed temp to 80 and wait.)
4  ;- Fan Speed: 100, 0 (set fan 0 to 100 )
5  ;- Print Speed: 50 (set print speed to 50)
6  ;- Flow Rate: 50 (set flow rate to 50)
7  ;- Message: Show this message (limited chars depends on machine maybe)
8  ;- Command: G28
```

# Injection!

```
197     static QCommandLineParser parser;
198     if (parser.optionNames().isEmpty()) {
199         parser.setSingleDashWordOptionMode(QCommandLineParser::ParseAsLongOptions);
200         parser.addOptions(d->options);
201     }
202
203     qCDebug(PRINT_THREAD) << "attempting to inject " << cmd;
204     parser.process(cmd);
205
206     if (parser.isSet(QStringLiteral("pause"))) {
207         d->core->pause(parser.positionalArguments().at(0));
208     } else if (parser.isSet(QStringLiteral("extruder temperature"))) {
209         QStringList args = parser.positionalArguments().at(0).split(QLatin1Char(','));
210         bool wait = !QString::compare(args.at(2).simplified(), QStringLiteral("true"), Qt::CaseInsensitive);
211         d->core->setExtruderTemp(args.at(0).toUInt(), args.at(1).toUInt(), wait);
```

src: <https://github.com/KDE/atcore/blob/master/src/core/printthread.cpp>



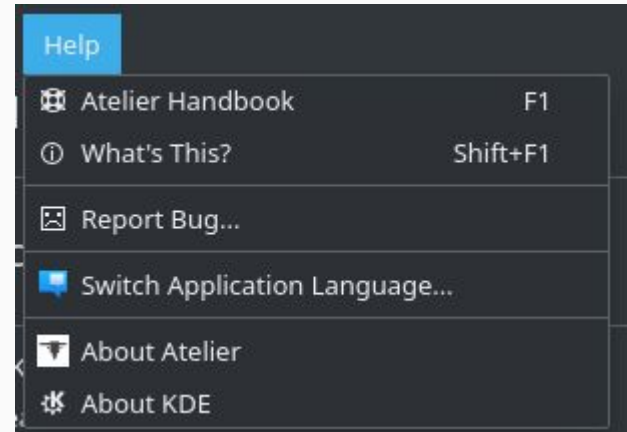
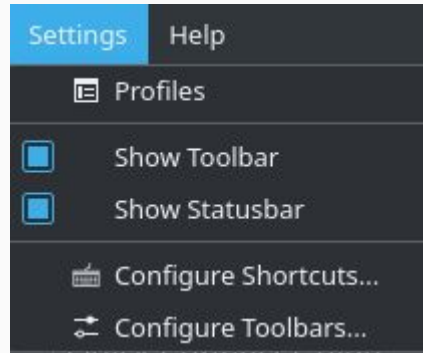
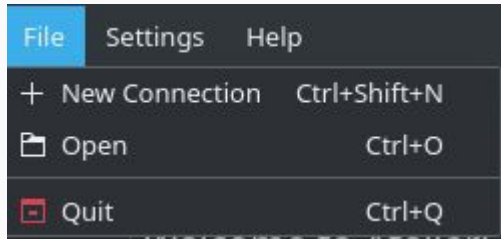
UI

# KDE Libraries

- l18n -  
Internacionalização
- XmlGui
- ConfigWidgets
- TextEditor

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <gui name="atelier"
3     version="1"
4     xmlns="http://www.kde.org/standards/kxmlgui/1.0"
5     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
6     xsi:schemaLocation="http://www.kde.org/standards/kxmlgui/1.0
7                         http://www.kde.org/standards/kxmlgui/1.0/kxmlgui.xsd" >
8
9     <MenuBar>
10         <Menu name="file">
11             <Action name="new_instance"/>
12             <Action name="open"/>
13             <Separator/>
14             <Merge/>
15             <Action name="quit"/>
16         </Menu>
17         <Merge/>
18         <Menu name="settings">
19             <Action name="profiles"/>
20         </Menu>
21     </MenuBar>
22     <ToolBar name="mainToolBar">
23         <Action name="open"/>
24     </ToolBar>
25 </gui>
26
```

# KXmlGui



# KTextEditor aka Kate

```
Marvin.gcode x MarvinDemo.gcode x
1 |Sliced at: Wed 11-05-2016 17:28:59
2 ;Basic settinaaags: Layer height: 0.2 Walls: 1.2 Fill: 15
3 ;Print time: 17 minutes
4 ;Filament used: 1.094m 3.0g
5 ;Filament cost: None
6 ;M190 S110 ;Uncomment to add your own bed temperature line
7 ;M109 S220 ;Uncomment to add your own temperature line
8 G22 ;metric values
9 G90 ;absolute positioning
10 M82 ;set extruder to absolute mode
11 M107 ;start with the fan off
12 G28 X0 Y0 ;move X/Y to min endstops
13 G28 Z0 ;move Z to min endstops
14 G1 Z15.0 F9000 ;move the platform down 15mm
15 G92 E0 ;zero the extruded length
16 G1 F200 E3 ;extrude 3mm of feed stock
17 G92 E0 ;zero the extruded length again
18 G1 F9000
19 ;Put printing message on LCD screen
20 ;Layer count: 127
21 ;LAYER:0
22 M107
23 G0 F9000 X97.275 Y94.282 Z0.300
24 ;TYPE:SKIRT
25 G1 F1200 X98.218 Y93.462 E0.06607
26 G1 X98.909 Y92.929 E0.11220
27 G1 X100.230 Y92.154 E0.19317
28 G1 X101.431 Y91.645 E0.26214
29 G1 X102.731 Y91.279 E0.33354
30 G1 X103.898 Y91.090 E0.39604
31 G1 X105.015 Y91.038 E0.45515
32 G1 X105.551 Y91.064 E0.48353
33 G1 X106.108 Y91.090 E0.51301
34 G1 X107.054 Y91.244 E0.56368
35 G1 X108.150 Y91.507 E0.62327
36 G1 X109.260 Y91.922 E0.68592
37 G1 X110.000 Y92.289 E0.72959
38 G1 X110.758 Y91.913 E0.77432

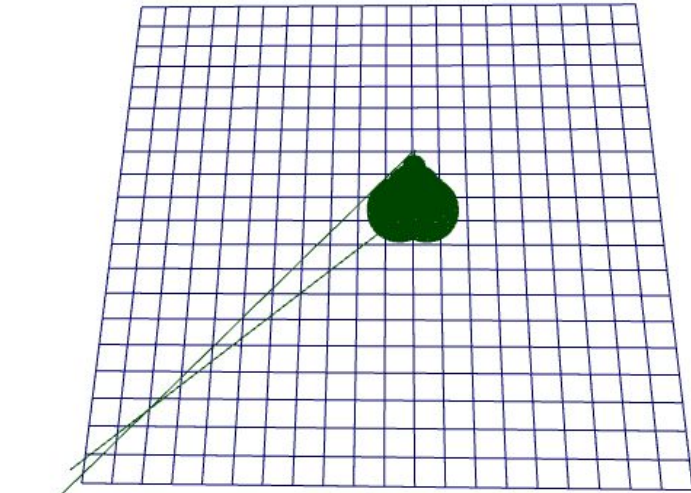
Line 1, Column 1 INSERT Soft Tabs: 4 UTF-8 G-Code
```



# Qt Libraries

- Core
- Widgets
- SerialPort
- Charts
- Qml/Quick
- 3D
- Multimedia

/home/lays/programs/atelier/MarvinDemo.gcode





# Atelier - Linux

Atelier

File Settings Help

Open Profiles

### Welcome to Atelier!

### Quick Connect Guide

- 1 - Create a Profile.
- 2 - Select the device.
- 3 - Select the profile and connect.

### Having a connection problem?

See the info section of the Log for common problems.  
Check our [Atelier Docs](#) for more information.

### Check our last news!

- [Akademy 2018: I was there! part 2 - 24 Sep 2018](#)
- [AtCore/Atelier update August '18 - 27 Aug 2018](#)
- [Akademy 2018: I was there! =D - 25 Aug 2018](#)
- [Atelier at The Developers Conference SP 2018 - 26 Jul 2018](#)
- [Atelier hits Flatpak - 02 Jul 2018](#)

### Get Involved

[Join our Telegram Group!](#)

You can also find us on Freenode IRC #kde-atelier

Cr10

Home: All X Y Z  Disable Motors Disconnect

Controls Advanced Sd Card

Move X Axis to 0,00 Go

Move Axis 1,000 mm Metric

HotEnd 140.5 200

X/Y Z E

Temp. Actual Ext.1 Target Ext.1

AtCore State: Connected to ttyACM0



# Atelier - Windows (Outdated)


The screenshot displays the Atelier printer host software interface. On the left, a text editor shows G-code generated by Simplify3D(R) Version 4.0.0. The code includes settings for process name, profile, material, quality, extruder, and layer height. The status bar at the bottom indicates 'Line 1, Column 1', 'INSERT', 'Soft Tabs: 4', 'UTF-8', and 'G-Code'.

On the right, the control panel for 'RK 300' is visible. It features a 'Home' button and a 'Disconnect' button. Below these are 'Controls', 'Advanced', and 'Sd Card' tabs. The 'Controls' tab is active, showing two gauges: 'Bed' (0-120) and 'HotEnd' (0-250). The 'Bed' gauge shows a reading of 40.35, and the 'HotEnd' gauge shows a reading of 210. A 'Move X Axis to' field is set to 0,00, with a 'Go' button. A circular diagram shows the X and Y axes. Below the gauges is a temperature graph with four data series: Actual Ext. 1, Target Ext. 1, Actual Bed, and Target Bed. The graph shows temperature over time from 14:29:38 to 14:31:38. The 'Actual Ext. 1' series (blue) starts at 0, rises to 225, and then fluctuates around 200. The 'Target Ext. 1' series (green) starts at 0, rises to 225, and then fluctuates around 225. The 'Actual Bed' series (orange) starts at 0, rises to 40, and then fluctuates around 40. The 'Target Bed' series (purple) starts at 0, rises to 40, and then fluctuates around 40. The status bar at the bottom indicates 'AtCore State: Connected to COM4 SD'.

# Atelier-OsX (Outdated)

Open

Welcome to Atelier!



Quick Connect Guide


- 1 - Create a Profile.
- 2 - Select the device.
- 3 - Select the profile and connect.

Having a connection problem?

See the info section of the Log for common problems.

Check our [Atelier Docs](#) for more information.

Check our last news!

Failed to fetch the News. 

Get Involved


[Join our Telegram Group!](#)

You can also find us on Freenode IRC #kde-atelier

test1

Home: All X Y Z  Disable Motors

```
[15:54:09:824] Found 2 Ports
[15:54:26:052] Attempting to Connect
[15:54:26:052] Firmware: Auto-Detect
[15:54:26:067] Waiting for firmware detect.
[15:54:26:067] Waiting for firmware detect.
[15:54:27:459]> M115\n\r
[15:54:28:276] Waiting for firmware detect.
[15:54:28:280] Waiting for firmware detect.
[15:54:30:382] Waiting for firmware detect.
[15:54:30:382] Waiting for firmware detect.
[15:54:30:394] Waiting for firmware detect.
[15:54:30:430] Waiting for firmware detect.
[15:54:31:430] Waiting for firmware detect.
[15:54:32:430] Waiting for firmware detect.
[15:54:33:429] Waiting for firmware detect.
[15:54:34:433] Waiting for firmware detect.
[15:54:35:432] Waiting for firmware detect.
[15:54:36:432] Waiting for firmware detect.
[15:54:37:435] Waiting for firmware detect.
[15:54:38:435] Waiting for firmware detect.
[15:54:39:438] Waiting for firmware detect.
[15:54:40:437] Waiting for firmware detect.
[15:54:41:437] Waiting for firmware detect.
```



AtCore State: Connecting...



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Perguntas?



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Atelier

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Qt



Obrigado!

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