```
In [1]: import pandas as pd
```

```
In [2]: #import matplotlib as plt
```

```
In [3]: import seaborn as sns
```

```
In [4]: #ES_INDEX_DATE="2018-01-28"
        ES_INDEX_DATE="2018-01-30"
        ES_INDEX_DATE="2018-02-03"

        DATA_FILE="../../rbcdata/%s/ldr" % ES_INDEX_DATE

        #DATA_FILE="../../rbcdata/total/%s/ldr" % ES_INDEX_DATE
        print DATA_FILE

        ../../rbcdata/2018-02-03/ldr
```

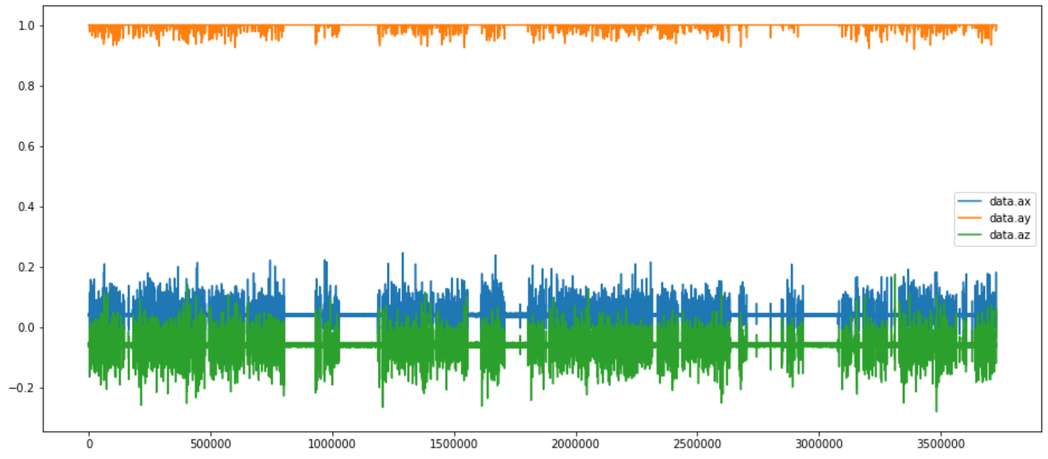
```
In [5]: %pylab inline
        pylab.rcParams['figure.figsize'] = (16, 7)

        Populating the interactive namespace from numpy and matplotlib
```

```
In [6]: data=pd.read_csv(DATA_FILE)
```

```
In [7]: data["acc"]= np.sqrt(data['data.ax']**2 + data['data.az']**2)
```

```
In [8]: section=75*60*60*48
```

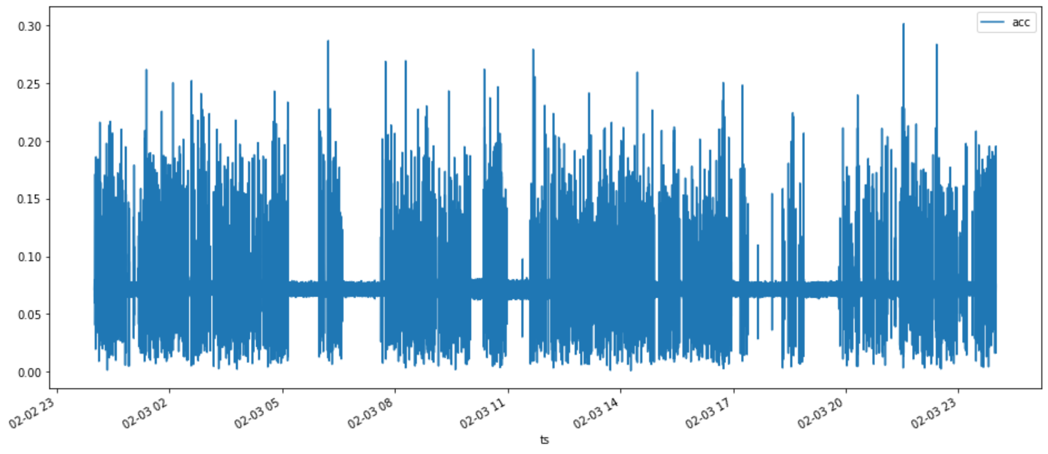
```
In [9]: data.head(section)[["data.ax","data.ay","data.az"]].plot()

Out[9]: <matplotlib.axes._subplots.AxesSubplot at 0x7f116a00c910>
```



```
In [10]: x=data[["timestamp","acc"]].head(section)
         x["ts"]=pd.to_datetime(x["timestamp"])
         x=x.drop(columns=["timestamp"])
         x=x.set_index("ts")
         x=x.tz_localize('UTC').tz_convert('Asia/Kolkata')
```

In [11]:
```
x.plot()
```

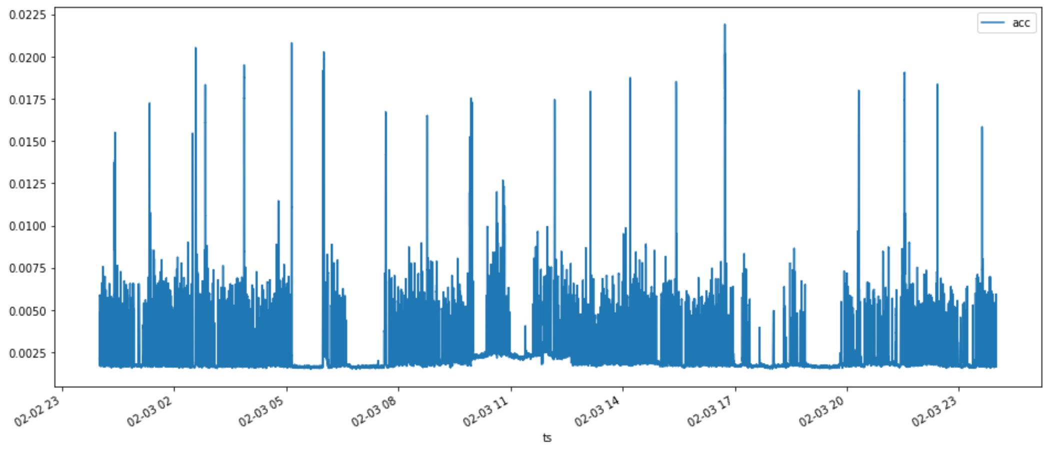
Out[11]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7f11696b4b50>
```



In [12]:
```
y=x.rolling(75*15).std()
```

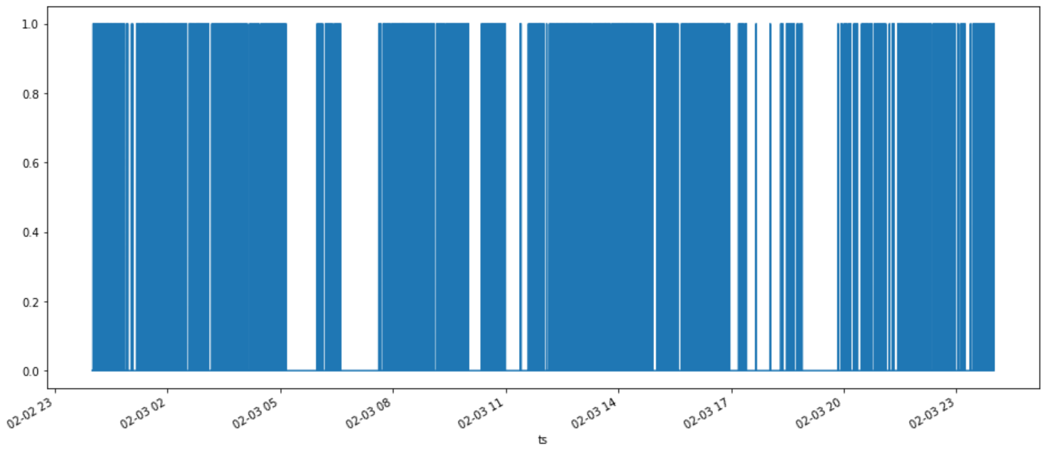
In [13]:
```
y.plot()
```

Out[13]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7f1127bf4190>
```

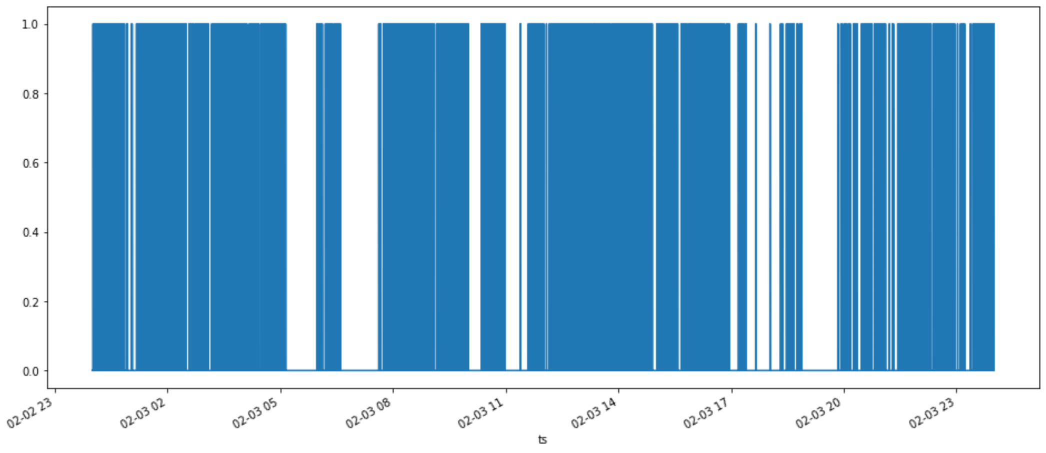


In [14]:
```
if ES_INDEX_DATE=="2018-02-02":
    thresholdVal=0.005
elif ES_INDEX_DATE=="2018-02-03":
    thresholdVal=0.003
else:
    thresholdVal=0.004
y["acc_thres"]=np.where(y['acc']>=thresholdVal, 1,0)
```

```
In [15]: y.acc_thres.plot()

Out[15]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10ef840a10>
```



```
In [16]: y["edges"]=y['acc_thres'] - y['acc_thres'].shift(1)

In [17]: y["pedges"]=np.where(y["edges"]>0,1,0)

In [18]: y.pedges.plot()

Out[18]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10e11a9c50>
```

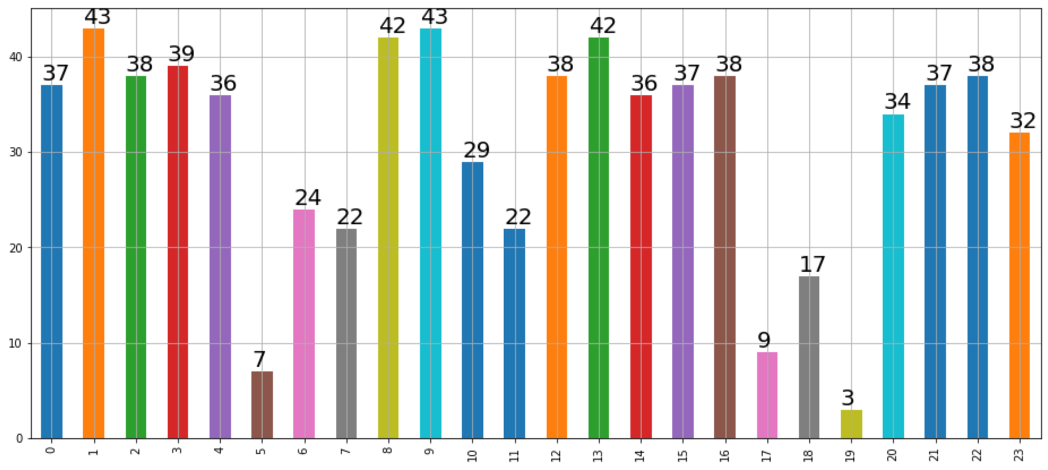


```
In [19]: #y.loc['2018-02-01 16:00:00':'2018-02-01 16:59:59']
```

In [20]:
```
dformat= ES_INDEX_DATE + " %s:%s"
npcb=[]
for hr in range(0,24):
    start=dformat%(hr,"00:00")
    end=dformat%(hr,"59:59")
    z=y.loc[start:end]
    zz=z.pedges.sum()
    npcb.append(zz)
    print [hr,zz],

print "\n\nTOTAL--->",sum(npcb)
disection=y.pedges.loc[dformat%("00","00:00"):dformat%("23","59:59")]
print disection.sum()
```

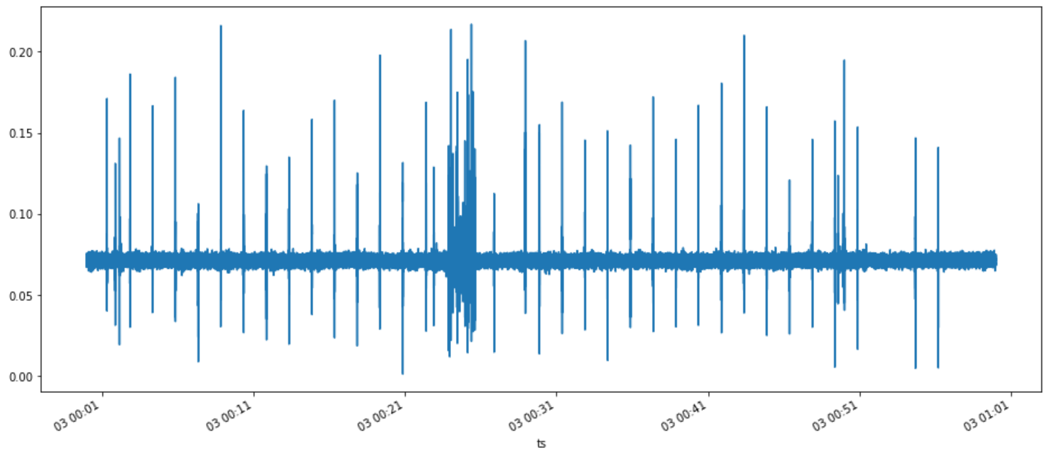
```
[0, 37] [1, 43] [2, 38] [3, 39] [4, 36] [5, 7] [6, 24] [7, 22] [8, 42] [9
, 43] [10, 29] [11, 22] [12, 38] [13, 42] [14, 36] [15, 37] [16, 38] [17,
9] [18, 17] [19, 3] [20, 34] [21, 37] [22, 38] [23, 32]

TOTAL---> 743
743
```

In [21]:
```
ax=pd.Series(npcb).plot.bar(grid=True)
for i in ax.patches:
    # get_x pulls left or right; get_height pushes up or down
    if i.get_height():
      ax.text(i.get_x(), i.get_height()+0.5, i.get_height() ,fontsize=20
,color='black')
```

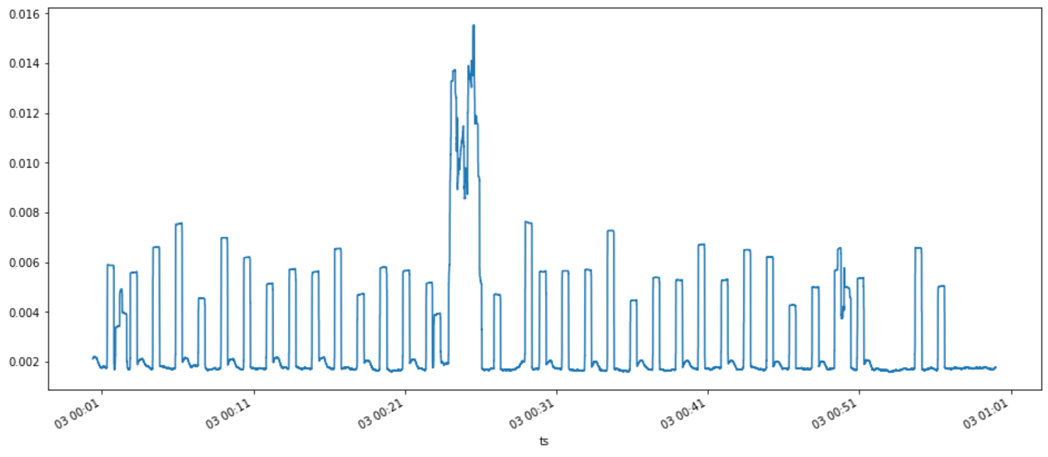


In [22]:
```
_hour=0
_startmins = "00:00"
_endmins = "59:59"
```

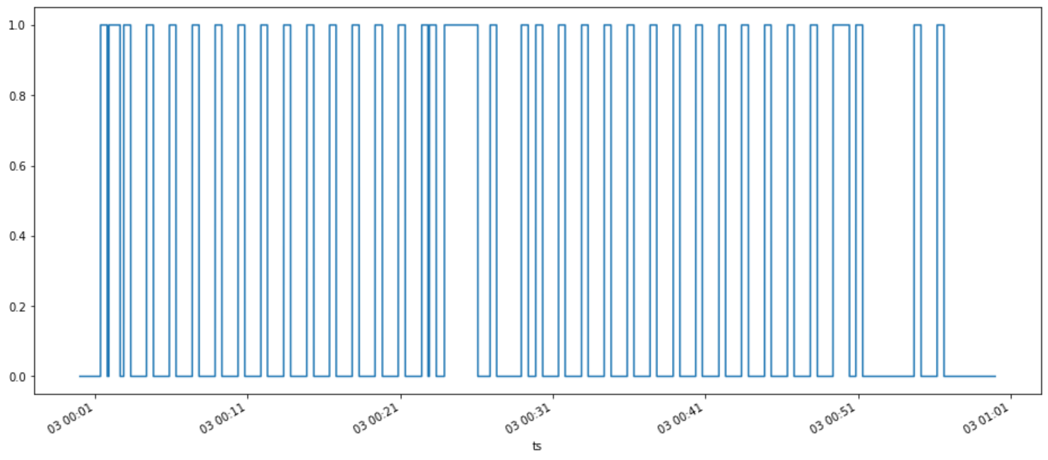
```
In [23]: x.loc[dformat%(_hour,_startmins):dformat%(_hour,_endmins)].acc.plot()
Out[23]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10e11b3750>
```



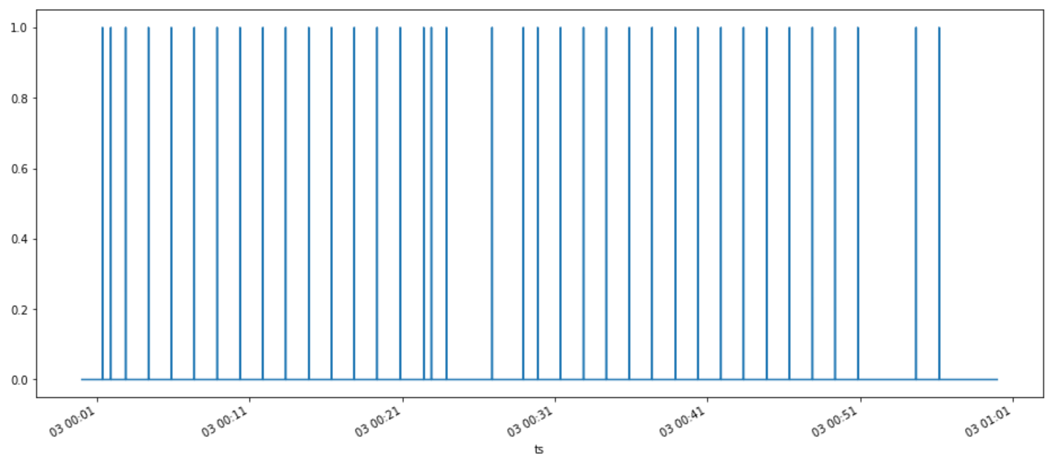
```
In [24]: y.acc.loc[dformat%(_hour,_startmins):dformat%(_hour,_endmins)].plot()
Out[24]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10ef8602d0>
```



```
In [25]: y.acc_thres.loc[dformat%(_hour,_startmins):dformat%(_hour,_endmins)].plo
         t()
Out[25]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10b7dcdb10>
```



```
In [26]: y.pedges.loc[dformat%(_hour,_startmins):dformat%(_hour,_endmins)].plot()

Out[26]: <matplotlib.axes._subplots.AxesSubplot at 0x7f10b855df10>
```



```
In [27]: #Time PER PCB

In [28]: pcbTime = y.loc[y.pedges==1]

In [30]: pcbTime["timestamp"]=pcbTime.index

         /home/sampad/Desktop/RBCCPS/lib/python2.7/site-packages/ipykernel_launche
         r.py:1: SettingWithCopyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row_indexer,col_indexer] = value instead

         See the caveats in the documentation: http://pandas.pydata.org/pandas-doc
         s/stable/indexing.html#indexing-view-versus-copy
           """Entry point for launching an IPython kernel.

In [33]: pcbTime.timestamp.diff().mean()

Out[33]: Timedelta('0 days 00:01:56.320423')

In [34]: pcbTime.timestamp.diff().std()

Out[34]: Timedelta('0 days 00:03:59.307854')
```