In [45]:

```python
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
%matplotlib inline
%pprint off
#plt.style.use('seaborn')
```

Pretty printing has been turned ON

In [46]:

```python
sns.set_style("ticks")
```

In [52]:

```python
df_all = pd.read_csv('data/cleaned.csv')
len(df_all)
```

Out[52]:

605948

In [53]:

```python
df_all = df_all.set_index(pd.to_datetime(df_all['localminute']), drop=True)
```

In [54]:

```python
df_all = df_all.drop(columns=['Unnamed: 0', 'localminute'])
```

In [55]:

```python
display(df_all.head(), len(df_all))
```

	marginal_change	cumul_value	meterid
localminute			
2015-10-01 05:00:00	0.0	93470.0	35
2015-10-01 06:00:00	0.0	93470.0	35
2015-10-01 07:00:00	0.0	93470.0	35
2015-10-01 08:00:00	0.0	93470.0	35
2015-10-01 09:00:00	0.0	93470.0	35

605948

In [56]:

```python
groups = df_all.groupby('meterid')
keys = groups.groups.keys()   # keys: an iterable of dataids or meter ids
```

In [57]:

```
id_list = list(keys)
display(id_list, len(id_list))
```

```
[35,
 44,
 77,
 94,
 114,
 187,
 222,
 252,
 370,
 483,
 484,
 661,
 739,
 744,
 871,
 1042,
 1086,
 1103,
 1185,
 1283,
 1403,
 1415,
 1507,
 1556,
 1589,
 1619,
 1697,
 1714,
 1718,
 1790,
 1791,
 1792,
 1800,
 1801,
 2018,
 2034,
 2072,
 2094,
 2129,
 2233,
 2335,
 2378,
 2449,
 2461,
 2470,
 2575,
 2638,
 2645,
 2755,
 2814,
 2818,
 2945,
 2946,
 2965,
 2980,
 3036,
 3039,
 3134,
 3310,
 3367,
 3527,
```

3544,
3577,
3635,
3723,
3778,
3849,
3893,
3918,
4029,
4031,
4193,
4228,
4296,
4352,
4356,
4373,
4421,
4447,
4514,
4671,
4732,
4767,
4874,
4998,
5129,
5131,
5193,
5275,
5317,
5395,
5403,
5439,
5484,
5545,
5636,
5658,
5785,
5810,
5814,
5892,
5972,
6101,
6412,
6505,
6578,
6673,
6685,
6830,
6836,
6863,
6910,
7016,
7017,
7030,
7117,
7287,
7429,
7460,
7566,
7674,
7682,

```
7739,
7741,
7794,
7900,
7919,
7965,
7989,
8059,
8084,
8086,
8155,
8156,
8244,
8386,
8467,
8703,
8829,
8890,
8967,
9052,
9121,
9134,
9160,
9278,
9295,
9474,
9600,
9620,
9631,
9639,
9729,
9766,
9849,
9956,
9982]
```

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In [58]:

```python
for i in id_list:
    df_i = groups.get_group(i)
    plt.cla()
    df_i['cumul_value'].plot(figsize=(15,4), title=f'meter {i}, {len(df_i)} samples')
    plt.show()
```

meter 35, 4392 samples

meter 44, 3438 samples

meter 77, 4391 samples

meter 94, 4391 samples

meter 114, 4384 samples

meter 187, 3849 samples

meter 222, 4392 samples

meter 252, 4392 samples

meter 370, 4390 samples

meter 483, 4392 samples

meter 484, 4392 samples

meter 661, 4390 samples

meter 739, 4392 samples

meter 744, 4390 samples

meter 871, 4392 samples

meter 1042, 4324 samples

meter 1086, 4392 samples

meter 1103, 2862 samples

meter 1185, 4392 samples

meter 1283, 4392 samples

meter 1403, 423 samples

meter 1415, 3846 samples

meter 1507, 4392 samples

meter 1556, 4392 samples

meter 1589, 4392 samples

meter 1619, 3849 samples

meter 1697, 4392 samples

meter 1714, 4392 samples

meter 1718, 4392 samples

meter 1790, 4391 samples

meter 1791, 4392 samples

meter 1792, 4313 samples

meter 1800, 4391 samples

meter 1801, 4392 samples

meter 2018, 4392 samples

meter 2034, 4392 samples

meter 2072, 4391 samples

meter 2094, 4391 samples

meter 2129, 4389 samples

meter 2233, 4361 samples

meter 2335, 4389 samples

meter 2378, 4327 samples

meter 2449, 4391 samples

meter 2461, 4390 samples

meter 2470, 3842 samples

meter 2575, 4389 samples

meter 2638, 4367 samples

meter 2645, 3476 samples

meter 2755, 428 samples

meter 2814, 996 samples

meter 2818, 3693 samples

meter 2945, 3768 samples

meter 2946, 421 samples

meter 2965, 4323 samples

meter 2980, 4390 samples

meter 3036, 430 samples

meter 3039, 4368 samples

meter 3134, 4389 samples

meter 3310, 3768 samples

meter 3367, 4392 samples

meter 3527, 4390 samples

meter 3544, 4392 samples

meter 3577, 4392 samples

meter 3635, 4392 samples

meter 3723, 3851 samples

meter 3778, 4381 samples

meter 3849, 4380 samples

meter 3893, 4392 samples

meter 3918, 3766 samples

meter 4029, 4392 samples

meter 4031, 4392 samples

meter 4193, 4353 samples

meter 4228, 4290 samples

meter 4296, 4389 samples

meter 4352, 4341 samples

meter 4356, 4379 samples

meter 4373, 3847 samples

meter 4421, 4366 samples

meter 4447, 4368 samples

meter 4514, 4392 samples

meter 4671, 3274 samples

meter 4732, 4384 samples

meter 4767, 4389 samples

meter 4874, 1 samples

meter 4998, 4392 samples

meter 5129, 4392 samples

meter 5131, 4392 samples

meter 5193, 3850 samples

meter 5275, 4392 samples

meter 5317, 431 samples

meter 5395, 4213 samples

meter 5403, 4392 samples

meter 5439, 3851 samples

meter 5484, 4391 samples

meter 5545, 1752 samples

meter 5636, 3850 samples

meter 5658, 2631 samples

meter 5785, 4392 samples

meter 5810, 4392 samples

meter 5814, 4392 samples

meter 5892, 4390 samples

meter 5972, 4392 samples

meter 6101, 186 samples

meter 6412, 4392 samples

meter 6505, 4213 samples

meter 6578, 2207 samples

meter 6673, 1830 samples

meter 6685, 3323 samples

meter 6830, 4378 samples

meter 6836, 4390 samples

meter 6863, 4341 samples

meter 6910, 4392 samples

meter 7016, 3768 samples

meter 7017, 4392 samples

meter 7030, 4392 samples

meter 7117, 4392 samples

meter 7287, 4392 samples

meter 7429, 4392 samples

meter 7460, 4368 samples

meter 7566, 407 samples

meter 7674, 4392 samples

meter 7682, 4392 samples

meter 7739, 4381 samples

meter 7741, 4368 samples

meter 7794, 3850 samples

meter 7900, 4390 samples

meter 7919, 4366 samples

meter 7965, 4158 samples

meter 7989, 3768 samples

meter 8059, 3663 samples

meter 8084, 4390 samples

meter 8086, 4384 samples

meter 8155, 3851 samples

meter 8156, 4392 samples

meter 8244, 430 samples

meter 8386, 2863 samples

meter 8467, 4368 samples

meter 8703, 501 samples

meter 8829, 4392 samples

meter 8890, 4392 samples

meter 8967, 3768 samples

meter 9052, 3850 samples

meter 9121, 4389 samples

meter 9134, 4391 samples

meter 9160, 426 samples

meter 9278, 4390 samples

meter 9295, 4392 samples

meter 9474, 4368 samples

meter 9600, 426 samples

meter 9620, 3241 samples

meter 9631, 4392 samples

meter 9639, 4306 samples

meter 9729, 4392 samples

meter 9766, 4372 samples

meter 9849, 4371 samples

meter 9956, 3138 samples

meter 9982, 4379 samples