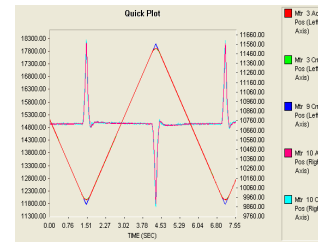
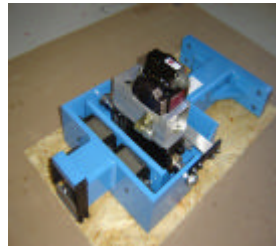




# THCE ELECTRONICS INC.

High Speed, Precision and Innovative Coiling Solution



= HSCS

## High Speed Coiling System for Aluminum Band Rolling Mills

The HSCS has been entirely developed by THCE engineering team. It contains new and original ideas which are incorporated in its hardware and software.

- *High Speed and Precision*
- *Reliability and Stability*
- *Flexible Configuration*





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## *Issues with previous coiling system:*

- Speed limitation ( maximum 500 m/min)
- Big following error (2.54mm(0.100inch))
- Poor product quality

Above issues seriously limit the production and quality. A new idea starts. In order to improve the performance and productivity, HSCS is manufactured and implemented by THCE.

## *HSCS has achieved:*

- Increase speed from 500m/min to maximum 1000 m/min. This would double the productivity for the same machine
- Minimized following error: 0.0254 mm(0.001inch) on linear movement, maximum 0.508mm(0.02inch) on changing direction limited by customer's mechanical parts
- Fully programmable coiling process parameters
- Remote control and monitoring
- Automated calibration and tuning
- Maintenance test software to verify the performance
- Easy to use customized process operating software with very short learning curve, to follow the exact clients needs and expectations





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## HSCS – Powerful Motion Controller

*Our system integrates motion and process control together. It provides a reliable, cost-effective, high performance and high speed solution.*



### Specification :

- *Up to 32 axis control*
- *240 MHz CPU, integrated PLC*
- *Capability for Complex algorithms*
- *Flexible hardware configuration*
- *Digital I/O, analog I/O*
- *SSI, analog, PWM digital feedback*
- *Analog, PWM digital output control*
- *Reliable and stable performance*
- *Multiple network interfaces available*



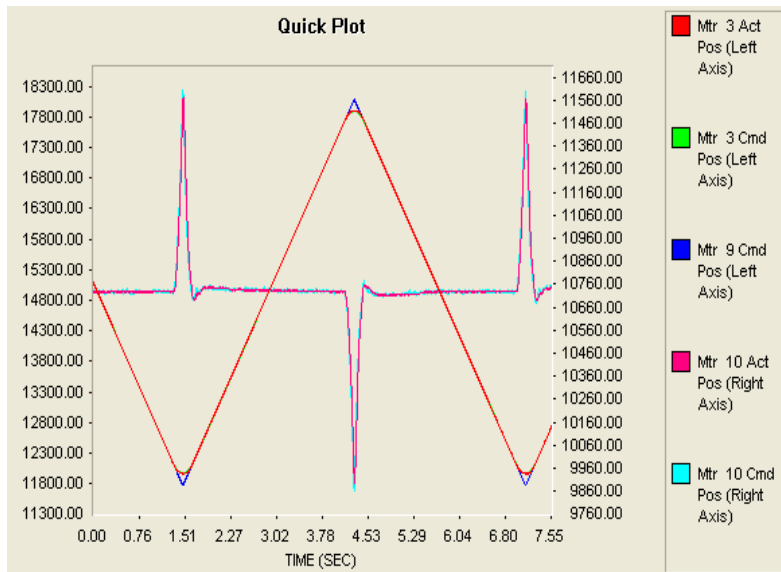


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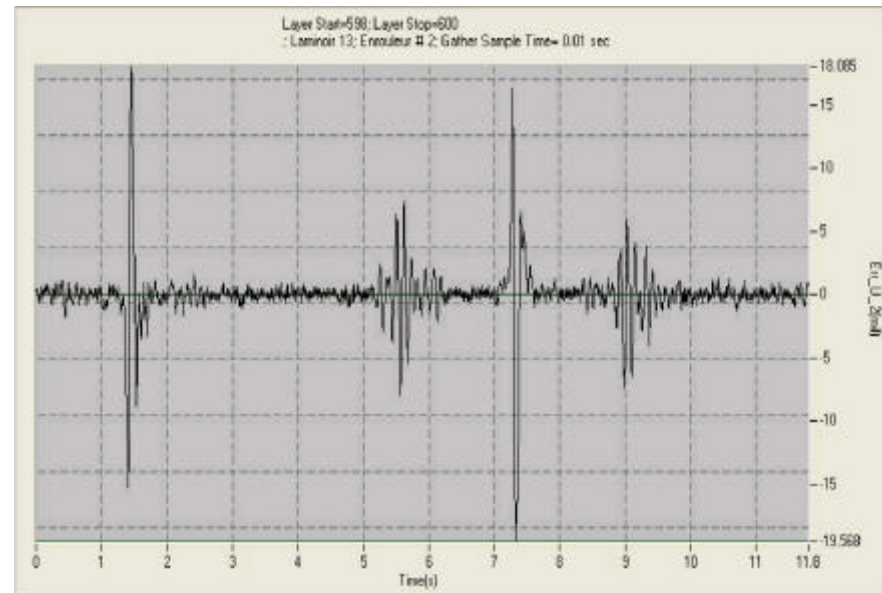
High Speed, Precision and Innovative Coiling Solution



## HSCS – Control Algorithm



- Real time algorithm
- Maximum 1000 m/min
- Maximum 0.508 mm (0.02inch) error between command position and actual position



- Fast response
- Reliable and stable solution
- Proved by real machine





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High Speed, Precision and Innovative Coiling Solution



## HSCS – Remote Control and Monitoring

Red Lion Upgrade Variables Table For 240MHz UMAC ( LAM 16)

ID	STATUS	TAG	DESCRIPTION	UM	Format	VARIABLE TAG	SIGN MODE	ENGRS BEFORE	ENGRS AFTER
1	ENSTAT	ENR1	LARGEUR COIL	mm	0.0000	ENR1 LARGEURCOIL	SOFT SIGN	0	4
2	ENSTAT	ENR2	PITCH	mm	0.0000	ENR2 PITCH	SOFT SIGN	0	4
3	ENSTAT	ENR3	WRAP	adm	0	ENR3 WRAP	SOFT SIGN	0	4
4	ENSTAT	ENR4	NOMBRE DE VIRAGES	adm	0	ENR4 NUM VIRAGES	SOFT SIGN	0	0
5	ENSTAT	ENR5	NOMBRE DE COUCHES	adm	0	ENR5 NUM COUCHES	SOFT SIGN	0	0
6	ENSTAT	ENR6	AXE U ACTIVE/INACTIVE	adm	0	ENR6 STATUS AXELU	SOFT SIGN	0	0
7	ENSTAT	ENR7	AXE U VS CMPSPD&B	adm	0.0000	ENR7 AXELU ERROR	SOFT SIGN	0	4
8	ENSTAT	ENR8	EN TENSION	mm	0	ENR8 EN TENSION	SOFT SIGN	0	0
9	ENSTAT	ENR9	S CURVE	mm	0.0000	ENR9 S CURVE	SOFT SIGN	0	0
10	ENSTAT	ENR10	ALARM CODE1	adm	0	ENR10 ALARM CODE1	SOFT SIGN	0	0
11	VENR	ENR11	LIBRE			ENR11 FREE1	SOFT SIGN	0	4
12	VENR	ENR12	LIBRE			ENR12 FREE2	SOFT SIGN	0	4
13	VENR	ENR13	LIBRE			ENR13 FREE3	SOFT SIGN	0	4
14	VENR	ENR14	LIBRE			ENR14 FREE4	SOFT SIGN	0	4
15	VENR	ENR15	LIBRE			ENR15 FREE5	SOFT SIGN	0	4
16	ENSTAT	ENR16	LARGEUR COIL	mm	0.0000	ENR16 LARGEURCOIL	SOFT SIGN	0	4
17	ENSTAT	ENR17	PITCH	mm	0.0000	ENR17 PITCH	SOFT SIGN	0	4
18	ENSTAT	ENR18	WRAP	adm	0	ENR18 WRAP	SOFT SIGN	0	4
19	ENSTAT	ENR19	NOMBRE DE VIRAGES	adm	0	ENR19 NUM VIRAGES	SOFT SIGN	0	0
20	ENSTAT	ENR20	PITCH	mm	0.0000	ENR20 PITCH	SOFT SIGN	0	0
21	ENSTAT	ENR21	NOMBRE DE COUCHES	adm	0	ENR21 NUM COUCHES	SOFT SIGN	0	0
22	ENSTAT	ENR22	AXE U ACTIVE/INACTIVE	adm	0	ENR22 STATUS AXELU	SOFT SIGN	0	0
23	ENSTAT	ENR23	AXE U VS CMPSPD&B	adm	0.0000	ENR23 AXLU ERROR	SOFT SIGN	0	0
24	ENSTAT	ENR24	EN TENSION	mm	0	ENR24 EN TENSION	SOFT SIGN	0	0
25	ENSTAT	ENR25	S CURVE	mm	0.0000	ENR25 S CURVE	SOFT SIGN	0	0
26	ENSTAT	ENR26	ALARM CODE2	adm	0	ENR26 ALARM CODE2	SOFT SIGN	0	0
27	VENR	ENR27	LIBRE			ENR27 FREE1	SOFT SIGN	0	4
28	VENR	ENR28	LIBRE			ENR28 FREE2	SOFT SIGN	0	4
29	VENR	ENR29	LIBRE			ENR29 FREE3	SOFT SIGN	0	4
30	VENR	ENR30	LIBRE			ENR30 FREE4	SOFT SIGN	0	4
31	VENR	ENR31	LIBRE			ENR31 FREE5	SOFT SIGN	0	4
32	ENSTAT	ENR32	LARGEUR COIL	mm	0.0000	ENR32 LARGEURCOIL	SOFT SIGN	0	4
33	ENSTAT	ENR33	PITCH	mm	0.0000	ENR33 PITCH	SOFT SIGN	0	4
34	ENSTAT	ENR34	WRAP	adm	0	ENR34 WRAP	SOFT SIGN	0	4
35	ENSTAT	ENR35	NOMBRE DE VIRAGES	adm	0	ENR35 NUM VIRAGES	SOFT SIGN	0	0
36	ENSTAT	ENR36	PITCH	mm	0.0000	ENR36 PITCH	SOFT SIGN	0	0
37	ENSTAT	ENR37	NOMBRE DE COUCHES	adm	0	ENR37 NUM COUCHES	SOFT SIGN	0	0
38	ENSTAT	ENR38	AXE U ACTIVE/INACTIVE	adm	0	ENR38 STATUS AXELU	SOFT SIGN	0	0
39	ENSTAT	ENR39	AXE U VS CMPSPD&B	adm	0.0000	ENR39 AXLU ERROR	SOFT SIGN	0	0
40	ENSTAT	ENR40	EN TENSION	mm	0	ENR40 EN TENSION	SOFT SIGN	0	0
41	ENSTAT	ENR41	S CURVE	mm	0.0000	ENR41 S CURVE	SOFT SIGN	0	0
42	ENSTAT	ENR42	ALARM CODE3	adm	0	ENR42 ALARM CODE3	SOFT SIGN	0	0
43	VENR	ENR43	LIBRE			ENR43 FREE1	SOFT SIGN	0	4
44	VENR	ENR44	LIBRE			ENR44 FREE2	SOFT SIGN	0	4
45	VENR	ENR45	LIBRE			ENR45 FREE3	SOFT SIGN	0	4
46	VENR	ENR46	LIBRE			ENR46 FREE4	SOFT SIGN	0	4
47	VENR	ENR47	LIBRE			ENR47 FREE5	SOFT SIGN	0	4
48	VENR	ENR48	LIBRE			ENR48 FREE6	SOFT SIGN	0	4
49	VENR	ENR49	LIBRE			ENR49 FREE7	SOFT SIGN	0	4
50	VENR	ENR50	LIBRE			ENR50 FREE8	SOFT SIGN	0	4
51	VENR	ENR51	LIBRE			ENR51 FREE9	SOFT SIGN	0	4
52	VENR	ENR52	LIBRE			ENR52 FREE10	SOFT SIGN	0	4
53	VENR	ENR53	LIBRE			ENR53 FREE11	SOFT SIGN	0	4
54	VENR	ENR54	LIBRE			ENR54 FREE12	SOFT SIGN	0	4
55	VENR	ENR55	LIBRE			ENR55 FREE13	SOFT SIGN	0	4
56	VENR	ENR56	LIBRE			ENR56 FREE14	SOFT SIGN	0	4

- Over 60 parameters in remote monitoring
- Fully programmable coiling process parameter
- Multiple industrial communication network available
- Maintenance test software
- HMI operator
- Alarm messages

Automatic Data Gather Configuration

1. Test Profile Configuration 2. Test Points

Test Profile

Online Machine:  Laminor 15

Test Operator: user

Test Result Location: E:\Vhce\Projects\Kong\AutoQA\Acer\AUTOOA\QTR\ANVERSE\bin\Release\testresult

Test Result Folder: 20080921

Sample Time (1 - 50ms):  ms

L'epaisseur de la bande:  mm

Next Step >>>

Automatic Data Gather Configuration

1. Test Profile Configuration 3. Test Points

Online Machine:  Laminor 15

Test Status

Extruder #1

RPM Layer:

Stop Start Stop Layer1 Layer2 Layer3

Extruder #2

RPM Layer:

Stop Start Stop Layer1 Layer2 Layer3

Message

Clear Window

Debug Mode

Change Testpoint

Hold Test

PREVIOUS

```
Code Alarme Enr1: 09
Code Alarme Enr2: 09
Code Alarme Enr3: 09
```

```
01=Hydraulique Off
02=Mode interface
03=Mouvement actif
04=Cmd hors Lim-Ope
05=Cmd hors lim-Mot
06=Position zero
07=Enc. non actif
08=Ready Off
09=Sel. non sur run
10=Boucle ouverte
11=Erreur de suivi
12=Pas de Mouvement
```

```
09090909
09090909
09090909
09090909
```

```
Virages1
Lar-Bobine1 0999
Stable1
Instable1
Accceptable1
Indetermi
```





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## HSCS – THCE Engineering Effort

- Several successful implementations
- Proven solution: in production since 2004
- Turn-key system
- Complete system integration
- Customized system design available





# ***THCE ELECTRONICS INC.***

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High Speed, Precision and Innovative Coiling Solution



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