#### Introduction

This application note describes how to set up a system with multiple icon actuators running synchronous.

① Always use the latest version of Concens Actuator Studio (CAS) and icon actuator with latest firmware.

This application example shows a setup with three icon actuators, which must run synchronized. The following parts are used:



- 1. 1 pc. icon programming cable
- 2. 2 pcs. icon patch cable (optional)
- 3. 3 pcs. conXion DIN or BOX (optional)
- 4. 3 pcs. icon actuators
- 5. 1 pc. handset or switches for control

Patch cable and conXion DIN/BOX are used only to make interconnection easier. This can be done with wires as well.

The icon actuators used, are configuration F/MDO with default settings, i.e. all actuators are delivered with the address 8. Step 1 can be skipped if actuators are pre-programmed.

An icon synchronized system consists of two to eight actuators and is built as a master/slavesetup. The master actuator always has address 200 and the slaves have addresses from 201 to 207.



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### Step 1: Assign address

Connect the actuator, which is supposed to be the master with address 200 and connect the programming cable. Then connect power.



Please note: It is not possible to connect all three actuators to the system now, because they are all delivered with address 8 as default. Connecting several actuators with identical address causes a conflict and results in malfunction of the system.

Now, start the CAS software on the PC. If CAS is running for the first time, the drivers will automatically be downloaded from the internet. Go to the "Overview" tab:

🔊 Concer	ns Actu	iator Stu	dio					-	×
ile Conf Iverview	Actua	ctory Sp ator Se	ecial	Graph Eactory 9	atting				
	710.101	101 34	No	of actuators:	is unity				
Scan /	Addres	ises	3	-					
	_	_	_						
Address:	8	÷	• 1	AN0105-1	Prd: 0x22158200	Uptime: 0:00:00:14.279	icon50, 24 V, Position, F/MDO		
Address:	0	÷	() <b>2</b>	?	?	?	7, 7, 7, 7		
Address:	0	-	03	?	?	?	2, 2, 2, 2		
				170 1015					
A:8	Upt	time: 0:0	0.00.14.	279 IDLE	HW	Ven 1, SW Ven 5.11			

Press the "Scan Addresses"-button:

CAS has now found an actuator with address 8. This is the default address.





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This first actuator will now be programmed to be the master with address 200. Please go to the "Service" tab and choose "Config".

Concerns Automatics Develop	
Concerns Actuator Studio	
benview Artuator Service Grant Eartory S	ing
Dead and the date	ng.
🗠 Read and Update	
Config Motor Parameters Export/Import Even	log DFU
Modius Address (1.247) Addustar Hom Betzadd Modus Read Delay (at) Betzadd Betza	Configuration: 0:2218200   Rec Configuration: 0:2218200   Configuration: 0:2218200   Configuration: 0:2218200   Max Representation: 0:30   Max Representation: 0:30   Res Representation: 0:30   Res Representation: 0:30   Static Output: 0:30   Static Output: 0:30   Special Service Register: 0:04000
R4-8 Untime: 0:00:07:25:908 IDLE	HW Var 1 SW Var 511

Now change the address from 8 to 200 by writing 200 in the "Modbus Adress" field. Press "Save/Update".

Go back to the "Overview" tab and verify that the address is now 200 for master.

6 Concern	s Actuator Stud	io					-	×
File Config	g Factory Spe	cial WWW	v					
Overview	Actuator Ser	rvice Gra	h Factory Settin	9				
_		No. of ac	tuators:					
Scan A	ddresses	3	÷					
Address:	200	1 AN	0105-1	Prd: 0x22158300	Uptime: 0:00:00:11.877	icon50, 24 V, Velocity, F/MDD		 _
Address:	0	2		7	?	7, 7, 7, 7		
Address:	0 ÷	03 7		?	?	2, 2, 2, 2		
MBA: 200	Uptime: 0:00	:00:11.877	IDLE	HWV	len: 1, SW Ven: 5.11			1

The same procedure is used to program the second and the third actuator to address number 201 and 202 respectively.





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Now connect all actuators as a system using the conXion DIN/BOX and the patch cables.

If the actuators come with eight pole Molex connectors, use the plugs instead of the screw terminals.

Go to the "Overview" tab and press "Scan Addresses".

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ile Config Werview	Factory Spe	icial N	Cranh En	ntony Cettin								
	Accostor Se	No. c	f actuators	:	,							
Scan Ad	fdresses	3	•									
Address:	200	•1	AN0105-1		Prd: 0x22158300	Uptime	: 0:00:08:44	.879	icon50, 24 V, Velocity, F/MD	0		
Address:	201	<b>2</b>	AN0105-2		Prd: 0x22158300	Uptime	: 0:00:06:19	.692	icon50, 24 V, Velocity, F/MD	0		
Address:	202 ÷	<b>3</b>	AN105-3		Prd: 0x22158300	Uptime	: 0:00:05:45	.624	icon50, 24 V, Velocity, F/MD	0		
BA: 202	Uptime: 0:00	05:45.6	524 10	DLE	HV	V Ver: 1, SW V	/er: 5.11					

The list will now show all three actuators.

All addresses are now set, and the system is ready to be programmed for synchronous operation.



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Page<sup>4</sup>

### Step 2: Pairing of icon actuators

In an icon synchronized system, the master communicates with the slaves. The master must know the other actuators in the system.

First step is to align all actuators and find the HOME position for each of them.

Go to the "Service" tab and select "Config". Enable the "Learn Home" function and press "Run Learn".

🕉 Concens Actuator Studio			-	$\times$
ile Config Factory Special	WWW			
overview Actuator Service	Graph Factory Setting			
Read and Update				
Config Motor Parameters Ex	port/Import Event Log DFU			
Mothour Address [1, 247] 200 Mothour Read Delay (un) a Deed Zane (Vis of Input) 10 Temp. Limit (C) (Developed) 90 Learn Stroke O Learn Stroke O Learn Stroke O Learn Stroke O Learn Rapp	Aduator Home Pration Maturad Sensed Aduator Ro, Od Vite Robert Source Speed [%] Run Learn Stop	Configuration: 0-2119000 Fax Current: 0-79 A Woltge: 34.22 V Max Current: 0.9 A C Current: 0.9 C Max Tegeratur: 38.2 C Max Tegeratur: 38.2 C Sarta Soundo: 1 Lies Sarta Soundo: 1 Lies Sarta Current: 0 Lies Sarta Current:		
Partial Res	set Actuator			

Do this for all actuators; address 200, 201 and 202.

All actuators are now aligned and in the HOME position.

As all icon actuators are shipped with all the parameters set from the factory, it is not necessary to perform the LEARN STROKE procedure.

🌀 Concens Actuator Studio				- 0
File Config Factory Special	www			
Overview Actuator Service	e Graph	Factory Setting		
Pos: 327		Run State: IDLE	Current: 0 mA	
Read and Update		Stop Reason: TARGET POSIT	ION REACHED Distance: 27	
Parameters Run Run F	Parallel I	Extra		
Speed [%]		Current Cutoff [mA], Inwards	H/L Min Speed [% of H/L speed]	Ramp acceleration [ms]
100		4000	50	1333
Home Offset [steps]		Current Cutoff [mA], Outwards	H/L Max Current [mA]	Ramp deceleration [ms]
300		4000	700	1333
Ramp Down before Target	t [steps]	Voltage Cutoff [mV], Low	H/L Check Time Limit [ms]	Ramp quick deceleration [ms]
0		9000	1000	666
Safe Zone OUT [steps]		Voltage Cutoff [mV], High	H/L Timeout [s]	
44879		29000	120	
Safe Zone IN [steps]		Max. Stroke Length [steps]		Maximum speed [ticks/s]
300		45029		450
				Deadband speed [ticks/s]
				10
				Check Delay, Current, Velocity change [ms]
				250
				Max Current Time Limit [ms]
				100
				Current offset calibration [mA]
			Save/Update	200
BA: 200 Uptime: 0:01:12:	20.862	IDLE H	W Vers 1. SW Vers 5.11	

Go to the "Actuator" tab and select "Parameters".

Check that all parameters on the master actuator are correct.





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Go to the "Actuator" tab and select "Run Parallel".

Sconcens Actuator Studio			- 0	$\times$
Config Factory Special	WWW			
erview Actuator Service	e Graph Factory Setting			
os: 327	Run State: IDLE	Current: 0 mA		
🗹 Read and Update	Stop Reason: TARGET POSITION REACHED	Distance: 27		
arameters Run Run P	Parallel Extra			
Target Position 1 [steps]	Target Position 2 [steps] Slaves: #201 #202	Pacallel Run Status		^
300	5000	Master Node is Scanning Slaves:		
		Write Response: C8 10 03 FF 00 01 20 24		
Due Decilier 4	Due Desliger 2	Read Request: C9 03 03 ED 00 01 04 33		
Kun Position 1	Run Position 2 Stop	Read Request: CA 03 03 FD 00 01 04 00		
		Read Response: CA 03 02 00 01 DC 54		
Learn Speed [%]		Read Request: CB 03 03 ED 00 01 05 D1		
100 ÷		Read Request: C8 03 03 ED 00 01 05 D1		
		Read Request: C8 03 03 ED 00 01 05 D1 Read Request: C8 03 03 ED 00 01 05 D1		
Learn Home	Scan Slaves	Read Request: C8 03 03 ED 00 01 05 D1		
Learning	Sear States	[Read Request: C8 03 03 ED 00 01 05 D1		
		Read Request: CB 03 03 ED 00 01 05 D1		
Learn Stroke	Clone Master	Read Request: CB 03 03 ED 00 01 05 D1		
Learn be one	Parameters	Read Request: CB 03 03 ED 00 01 05 D1		
		Read Request: CC 03 03 ED 00 01 04 66		
In Parallel mode,	the Master node is by design always #200.	Read Request: CC 03 03 ED 00 01 04 66		
		Read Request: CC 03 03 ED 00 01 04 66		
When the status is gi	reen, any key may be pressed. When red, only	Read Request: CC 03 03 ED 00 01 04 66		
	stop may be used.	Read Request: CC 03 03 ED 00 01 04 00 Read Request: CC 03 03 ED 00 01 04 00		
		Read Request: CC 03 03 ED 00 01 04 66		
After a button is press	ed, "Read and Update" is temporary stopped and	Read Request: CC 03 03 ED 00 01 04 66		
execute status are sca	anned according to the protocol. After execution,	Read Request: CC 03 03 ED 00 01 04 66		
"Read	d and Update" are started again.	Read Request: CC 03 03 ED 00 01 04 66		
(5: 200   Lintime: 0:01-13-1	51 387 IDLE HW Mar 1 SW Mar	511		
a spanne wontrol				

Press **Scan Slaves** on the master and CAS will find the slaves.

Press Cone Master Parameters This will copy the parameters from the master to the slaves, which ensures that all actuators have identical parameters. This is important for the synchronized setup to work correct.

When this has been done, check that all parameters are correct.





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### Concluding remarks

Please note: When working with CAS and a synchronized actuator setup, it is important only to use the "Run Parallel" tab as other tabs may interfere with the operation of the synchronized system.

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S Concens Actuator Studio				-	×
Duantieur Actuator Service	Graph Eactory Setting				
Deci 200	Due Chater TOLE		Current 0 - 1		
POS: 300	Run State: IDLE		Current: 0 mA		
☑ Read and Update	Stop Reason: BO	DTED	Distance: 300		
Parameters Run Run Pa	arallel Extra				
Target Position 1 [steps] 300	Target Position 2 [steps] 5000	Slaves: #201 #202	Parallel Run Status		^
Run Position 1	Run Position 2	Stop			
Learn Speed [%]					
Learn Home		Scan Slaves			
Learn Stroke		Clone Master Parameters			
In Parallel mode, I	the Master node is by des	ign always #200.			
When the status is gre	een, any key may be pres stop may be used.	sed. When red, only			
After a button is presse execute status are scai "Read	d, "Read and Update" is t nned according to the pro and Update" are started	emporary stopped and tocol. After execution, again.			
IBA: 200 Uptime: 0:00:05:31	7.074 IDLE	HW Ver. 1, SW Ver.	i.11		

Please be sure to untick the "Read and Update" feature when using handset or other switches for control. If this is not done, CAS may interfere with the operation of the synchronized system.

6 Concens Actuator Studio				-	×
File Config Factory Special	www				
Overview Actuator Service	e Graph Factory Setting				
Pos: 300	Run State: IDLE		Current: 0 mA		
Read and Update	Stop Reason: BOO	DTED	Distance: 300		
Parameters Run Run Par	Parallel Extra				
Target Position 1 [steps] 300	Target Position 2 [steps] 5000	Slaves: #201 #202	Parallel Rum Status		
Run Position 1	Run Position 2	Stop			
Learn Speed [%]					
Learn Home		Scan Slaves			
Learn Stroke		Clone Master Parameters			
In Parallel mode, When the status is g	the Master node is by des reen, any key may be pres stop may be used.	ign always #200. sed. When red, only			
After a button is presso execute status are sco "Read	ed, "Read and Update" is to anned according to the prot d and Update" are started a	emporary stopped and tocol. After execution, again.			
					~
4BA: 200 Uptime: 0:00:07:	39.670 IDLE	HW Ver: 1, SW Ver:	5.11		

Please contact <a href="mailto:support@concens.com">support@concens.com</a> for further information.

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Page