1 Preface

This customer information describes the essential differences between the hardware, firmware and software of the six different controller cards (40 MHz, 50 MHz, 60 MHz, respectively frontal and lateral). The customer information is a supplement to the Manual: **MULTI DRIVE VVVF DSV 5445/5444 LIFT**.

2 Regulationboards

The series DSV 544x / 544x GSV is being equipped with six different controller cards, which are divided into two groups: Connector X1 to X4 frontal, or connectors X1 to X4 lateral Both groups are divided into the parts lists for 40-MHz clock, 50-MHz and 60 MHz. 40-MHz and 50 MHz only differ in clock-time and possible firmware and software. 60-MHz is a completely new hardware, firm- / software!

2.1 Overview of article-numbers

Based on the equipment series DSV 544x / GSV 544x (power section) run the following controller card:

Article No.	Description	Firmware
95443201	Regulationboard 2-250A 40MHz FRONTAL	TUDYxxN, RSDZAx, SSIIBSxx
95443221	Regulationboard 2-250A 40MHz LATERAL	TUDYxxN, RSDZAx, SSIIBSxx
95443222	Regulationboard 2-250A 50MHz LATERAL	TUDZxxN, TUDXxxN, RSDZAxN
95443223	Regulationboard 2-250A 50MHz FRONTAL	TUDZxxN, TUDXxxN, RSDZAxN
95445222	Regulationboard 3-400A 60MHz LATERAL	TUDWxxN (60 MHz)
95445223	Regulationboard 3-400A 60MHz FRONTAL	TUDWxxN (60 MHz)

2.2 The compatibility of 60-MHz to recent series with 40-MHz or 50-MHz clock.

For the customer nothing is changed regarding the connectors, because these 60-MHz devices are designed with backward compatibility. A replacement of older equipment is possible without problems.
Note: Allowed software must have an index 132 or higher to get compatible functions (see gearlist.pdf)!

At the request of customers, the hardware properties of the following inputs and outputs are improved:

ISP (X1 pin 5): Input-load-current (old 4mA at 24V) now 20mA at 24V to improve stable an input-signal

E0 (X2 pin 16): Input-load-current (old 4mA at 24V) now 20mA at 24V to improve stable an input-signal

A9 (X1 pin 2): Output-load-current (old max. 100mA) now up to 200mA to improve higher output-loads

BB (X1 pin 3): Output-load-current (old max. 100mA) now up to 200mA to improve higher output-loads

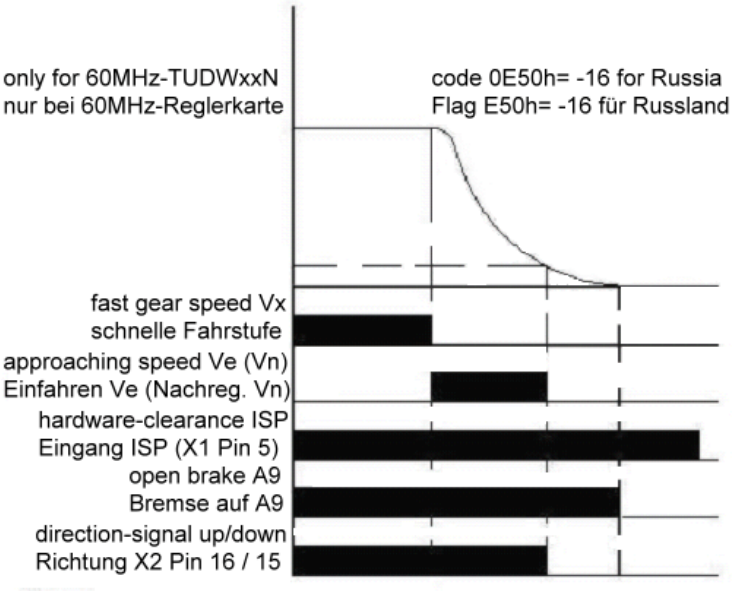
Some option cards are no longer - or only with little modifications - supported, or are no longer necessary (like for the GSV). Based on series DSV 544x / GSV 544x the following option cards are affected:

Article No.	Description	The reason for technical restriction
95445439	OPTION Field current control GSV 544x	no longer necessary for GSV 544x
95445437	OPTION 2.-encoder + GAL + COUNTER F	no clock-signal for counter and GAL
95444436	OPTION 2-channel-analoge-output frontal	no longer necessary for DSV 544x
95444435	OPTION X6-encoder-output (old) frontal	Layout has to be changed regarding pin 6 of MIC-connector, because pin 6 now for 5V (old = gnd), or cut the flat-cable line '6'
95444443	OPTION X6-encoder-output (old) lateral	
95443437	OPTION RESOLVER 14-16BIT AE06 frontal	remove diode D41 (regulation-board)
95443438	OPTION RESOLVER 14-16BIT AE06 lateral	remove diode D41 (regulation-board)
95444431	OPTION PROFIBUS DP DSV5444 frontal	in 2010 still no new software available
95444438	OPTION INTERBUS-S DSV5444 frontal	in 2010 still no new software available
95445431	OPTION CAN-BUS + SOFTWARE frontal	in 2010 still no new software available
95445432	OPTION CAN-BUS + SOFTWARE lateral	in 2010 still no new software available

Please also read latest documents: list_of_new_variables.xls and DSV5445_new_variabel.doc /.pdf , also manual for 'SMD'-FU-Control: ki0503d0.doc / .pdf or ki0503e0.doc / .pdf and gearlist.htm / .pdf !

2.3 Some new added functions and improvements using 60-MHz-technology:

a) A new input-code is now added for lift-plc's used at Russian market:



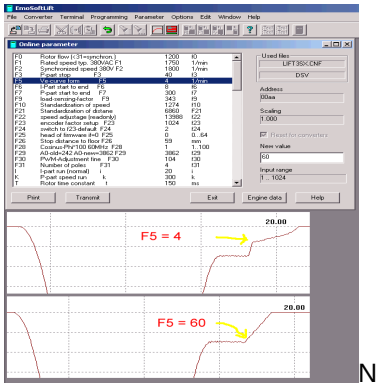
60MHz (ADL)	Up	Down	Bin0	Bin1	Bin 2	Action	binary-flag
ISP	**E0**	**E1**	**E2**	**E3**	**E4**	**DSV -> Lift-PLC**	**0E50**
0	X	X	X	X	X	Emergency stop	-16
1	0	0	X	X	X	Stop (normal mode after Ve / Vn)	-16
1	0	0	0	0	0	Wait to a next ride	-16
1	**1**	0	X	X	X	Up-direction	-16
1	0	**1**	X	X	X	Down-direction	-16
1	**1**	**1**	X	X	X	No operation	-16
1	**1**	0	0	0	0	Stop (normal mode, all speeds)	-16
1	**1**	0	0	**1**	0	Ve	-16
1	**1**	0	0	0	**1**	Vi	-16
1	**1**	0	**1**	0	**1**	V1	-16
1	**1**	0	0	**1**	**1**	V2	-16
1	**1**	0	**1**	**1**	0	V3	-16
1	**1**	0	**1**	0	0	Vn	-16
1	0	**1**	0	0	0	Stop (normal mode, all speeds)	-16
1	0	**1**	0	**1**	0	Ve	-16
1	0	**1**	0	0	**1**	Vi	-16
1	0	0	**1**	0	**1**	V1	-16
1	0	**1**	0	**1**	**1**	V2	-16
1	0	0	**1**	**1**	0	V3	-16
1	0	**1**	**1**	0	0	Vn	-16

The code -16 (ADL) has same results as code 255 (KEB), only different: E0 + E1='low' -> drive to floor!

b) Added new parameters and varaibles (or changed range of values):

addr.	parameter / variable		Comments and instructions (standard)	TUDX/Y/Z	TUDW
F0	**f0 Rotor flow (rotor flux)**	P	F0 < 31 means at TUDZ or TUDW that a synchronous motor is connected. Is driven TUDW with an asynchronous motor, the rotor flux is now 4 times as high a value, as calculated with old TUDY/TUDX!	**26...2000**	**26…8000**
F5	**f5 Ve curve form**	P	F5 corrects the form of positioning (depends on values from 'Ve' and 'F26'). Long distance from 'F26' and low 'Ve' the default settings always ok. For the normal gearbox-winches set value of F5 => 0E08+1	**Asynchr.1 …101 Synchr. 1…4**	**Asynchr. 1…161 Synchr. 1…6**
F6	**I-part start to end**	P	Using TUDW the value of I-part should be the half of the value as given for TUDZ / TUDY / TUDX, to get the same effect and result of regulation (way 'F26')!	**2…400**	**1…200**
F7	**P-part start to end**	P	The P-part 'F7' and 'k' normal have the same value. Using TUDW the P-part is the same as in TUDY/ TUDX, but 2 times as high a value, as used in TUDZ!	**50…2000**	**100…4000**
F9	Load-sensing-factor	P	Control parameter for analogue set-point. The value for TUDW is a quarter of the value as shown in TUDZ	4…4000	1…1000
F10	Standardization of speed	P	These parameters are depending of the internal encoder-multiplication (16, 64, 256, 512), the increments of used encoder and the data of gearbox (E48 also must have value 255 to allow the calculation). TUDW has the same values as shown in TUDZ, but from TUDY or TUDX the values for normal gearbox-winches are different: Parameter F10 is 2 times more and F9 is 8 times less for gearbox-winch!	1…20010	1…20010
F21	Standardization of distance	P		10…4096	20…8192
F22	Speed adjustage (read)	P		1…13988	2…27976
F23	Encoder factor setup	P	These cells are used only for diagnostic purposes. The value of 'F23' using TUDX/Y are normal increments of encoder / 4, or (using TUDZ) it's pulses * 4	128… 16384	125… 20000
F24	Verstärkung I-Regler	P	TUDWxxN > 27.01.2012 need this information for an encoder-less vector-control (flag 0E60h set to -256)!	2	**1**
F28	**Motorspannung / EMK**	P	TUDWxxN > 27.01.2012 need this information for an encoder-less vector-control (flag 0E60h set to -256)! The value is Volt and works together with value 'F1'.	1…2047	**48…690**
I	**I-part run (normal)**	P	I-part for speed-control during main ride. A higher value makes the ride smoother (example '40'). This parameter is read-only, because it will be switched between the values given from 0E1C und 0E1E. Usingi TUDY, TUDX or TUDZ: i = k/159 is the smallest value. For TUDW: i = k/639 is the smallest value.	**2…400**	**1…200**
K	**P-part speed run**	P	P-part for speed-control (see value of 'F7' as default) has the following maximum value if a TUDW is used: k = i *639 (for TUDX / TUDY maximum: k = i * 159)!	**25…2500**	**50…5000**
t	**T Rotor time constant**	P	For TUDX, TUDY and TUDW same values, but using TUDZ the values is double! Note: Using older asynchronous engines the value could be below 50, for synchronous motors the value is fixed in the program (like the value of parameter 'F0' in a range 25 … 31).	**25…2000**	**25…2000**
B34	**version of program**	V	TUDX/Y/Z... capable software should have an index of 117 or higher, the TUDWxxN needs 125 or higher!	**min. 117 (132…135)**	**min. 125 (132…135)**
B36	**RHO-speed**	V	Virtual searching speed to find RHO-offset under load and closed brake. The default value is 15000. Please change only if 'RHO' is not found correct. This value and function is only available with TUDWxxN-60MHz!	0…15000	**2500… 30000**
B38	**s-max Kontrolle (read)**	V	needed to calculate F0 in case of 60MHz (page 47)	0…4096	**0…16000**
B3A	**ke=V/(1000rpm)*1 (read)**	V	value = 10* **ke** (generated from F1 and F28), it's only needed for encoder-less vector-control mode 60MHz	0	**1…32776**

B3C	**R1=mOhm Milli-Ohm**	V	Innenwiderstand R1 der einzelnen Motorwicklung (Stern = 0,5*R=R1, Dreieck=R1), nur bei 60MHz !	0	**1…10000**
B3E	**BRUSH syn=255 asyn=0**	V	Entscheidet Synchron oder Asynchron-Motor (nur bei geberlosem Betrieb mit 60MHz und File = Index-135)	0	**0…255**
E1C	**I-part stop and hold**	V	This I-part 0E1C is used against starting jerk or ride-back during opening the brake. TUDW: i = k / 639 is smallest value, for TUDY/X/Z it's limited to i = k / 159.	**2…80**	**1…40**
E0E	linear emergency ramp	V	Linear section of the ramp during inspection-mode, typical 80 (for soft stop it's set to 8 also)	8…80	2…300
E10	stop with s-curve	V	Instead of using INT (F26=255) this value controls s-ramp and distance to floor (default=8)	2…20	1…150
E1E	**I-part run (new)**	V	I-part 0E1E is used during the normal riding to get a smooth reaction of cabin. For TUDW: i = k / 639 is smallest value, for TUDY/X/Z it's limited to i = k / 159.	**4…400**	**2…200**
E30	Current shunt Ohm*10	V	look at table on the end of page 5 (only with 60-MHz)	0	100-2000
E32	Current.-sensor factor Kn	V	look at table on the end of page 5 (only with 60-MHz)	0	1000-8000
E34	**Motor-lost-err. 60MHz**	V	Only 60MHz: Allowed range of current-asymmetry	**0**	**400…800**
E36	**Motor-lost-flag 60MHz**	V	0 = default, 255 activates motor-lost (only Russia)	**0**	**0…255**
E38	**Motor-lost-time 60MHz**	V	Only 60MHz: Allowed range to accept lost signals	**0**	**100…500**
E3A	**Motor-lost-hyst 60MHz**	V	Only 60MHz: Allowed range of voltage-asymmetry	**0**	**200…800**
E3E	**JP3-Flag TTL+HTL=255**	V	Encoder-type (1Vpp=0, TTL=255, set Jumper JP3), Note: 60MHz has no jumper JP3 (for HTL use -256)	**0…255**	**-256…255**
E48	**A3-old=449 A3-new=475 (ab TUDW, Index ab 129)** **Calculation? Yes=255 (old files up to Index 128)**	V	using TUDW-firmware and files index 129 or higher: E48=449 -> A3 output -> no overspeed is happened E48=475 -> A3 output -> tolerance-band 0E56h is ok using TUDY, TUDX, TUDZ up to the file-index 128: E48=0 -> no calculation, E48=255 -> calculation ok but index 129 or higher: please set it always to 449!	**0…449**	**449…475**
E50	**Decimal/binary flag**	V	0=decimal, 255=KEB, -256=CT, 15=BLT, now added in TUDW: -16=ADL (see details in code-table page 2)	**-256… 255**	**-256…255**
E56	**Hysterese Vx / Verf. (TUDW, Index min. 129)** **64_256_FLAG 50 MHz (alte Files bis Index 128)**	V	New function: Speed-control with a tolerance-band, values in m/s, typ. 100mm/s, 0E48h must be set 475 Old function: Shows the internal fine-pitch-factor: 0=16f./64f., 15=64f. (TUDW), 255=256f., -256=512f.	**-256 …255**	**0…500**
E5C	**Search-RHO ATB-gearl.**	V	Only 60MHz: -256 = first-initialisation (closed brake)	**0…255**	**-256…255**
E60	**Service flag (hidden)**	V	Using TUDW the additional mode -256 is available, which can be used for generally riding all motors in the encoder-less mode, see details: LESSNEW.HTM	**0…255**	**-256…255**
E6A	**Resolver-V / S-limit**	V	Resolver voltage value 85 = 6.3 V (min. 70 to max. 90 are in this case correct for the EPM series from Alpha-Wittenstein). In case of files with index higher than 128 that value (%) sets the nominal current limit!	**0…127**	**0…127**



New parameter F5 to adjust positioning curve Ve (0E08h)/F26

var. \ unit	10A	15A	20A	30A	40A	40A	50A	60A	80A	80A	120A	150A	200A	250A	320A	400A	3A	6A	9A	12A	16A	25A	32A	45A
0e30h	1000	1000	1500	953	2000	1000	1500	665	487	487	300	267	200	150	124	100	1000	1000	1000	1000	1000	1000	1000	1000
0e32h	500	500	1000	1000	2000	1000	2000	1000	1000	1000	1000	1000	1000	1000	1000	1000	125	250	500	500	1000	1000	1000	1000
BGR	1	1	2	2	3	3	3	3	4	3	4	4	5	5	5	5	1	1	1	1	2	2	2	3
Firmware	04N	05N	05N	05N	06N	06N	06N	06N	06N	06N	06N	06N	06N	06N	06N	06N	A3N	A3N	A2N	A3N	A2N	A3N	A4N	A5N
Serie Amp	40	48	48	48	60	60	60	60	60	60	60	60	60	60	60	60	32	32	28	32	28	32	40	48
Ub4 Volt	9	9	9	7,6	10	9	10	5	5	10	10	5,4	5,6	4,25	4,7	3,1	11	8	7	9	6	8	8	11
R-shunt Ohm	100	100	150	95,3	200	100	150	66,5	48,7	48,7	30	26,7	20	15	12,4	6,65	100	100	100	100	100	100	100	100
R-gate Ohm	56,2	56,2	39,2	27,4	22,1	22,1	15	15	10	15	5,62	4,7	3,32	3,32	2,74	2,74	82,5	82,5	68,1	56,2	39,2	39,2	27,4	22,1
Wdg current	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8	4	2	2	1	1	1	1
R-reg K-Ohm	33,2	33,2	33,2	33,2	33,2	33,2	33,2	66,5	33,2	66,5	33,2	66,5	66,5	66,5	66,5	100	33,2	33,2	33,2	33,2	33,2	33,2	33,2	33,2
Lem/VAC	1000	1000	1000	1000	2000	1000	2000	2000	1000	2000	1000	2000	2000	2000	2000	2000	1000	1000	1000	1000	1000	1000	1000	1000
max. kHz	15	12	12	12	12	12	12	12	10	10	5,0	5,0	5,0	2,5	2,5	2,5	5,0	5,0	5,0	5,0	5,0	5,0	5,0	5,0
R96 K-Ohm														4,75	4,75	4,75								
f24 60MHz	1	1	1	1	1	1	1	2	2	1	1	2	2	2	2	3	1	1	1	1	1	1	1	1
CNYD-Type:	**10A**	**12A**	**15A**	**25A**	**30A**		**40A**	**45A**	**60A**															
nominal A	10	12	15	25	30		40	45	60															
dynamic A	20	24	30	50	60		80	90	120															
case-form	1	1	2	2	3		3	3	3															
max. kHz	15	12	12	12	12		12	12	10															

example for CNYD 15A or Europe 20A: see partlist 924L50C0

example for CNYD 25A or Europe 30A: see partlist 924L50E0

example for CNYD 30A or Europe 40A: see partlist C34L50F1

example for CNYD 40A or Europe 50A: see partlist C34L50G1

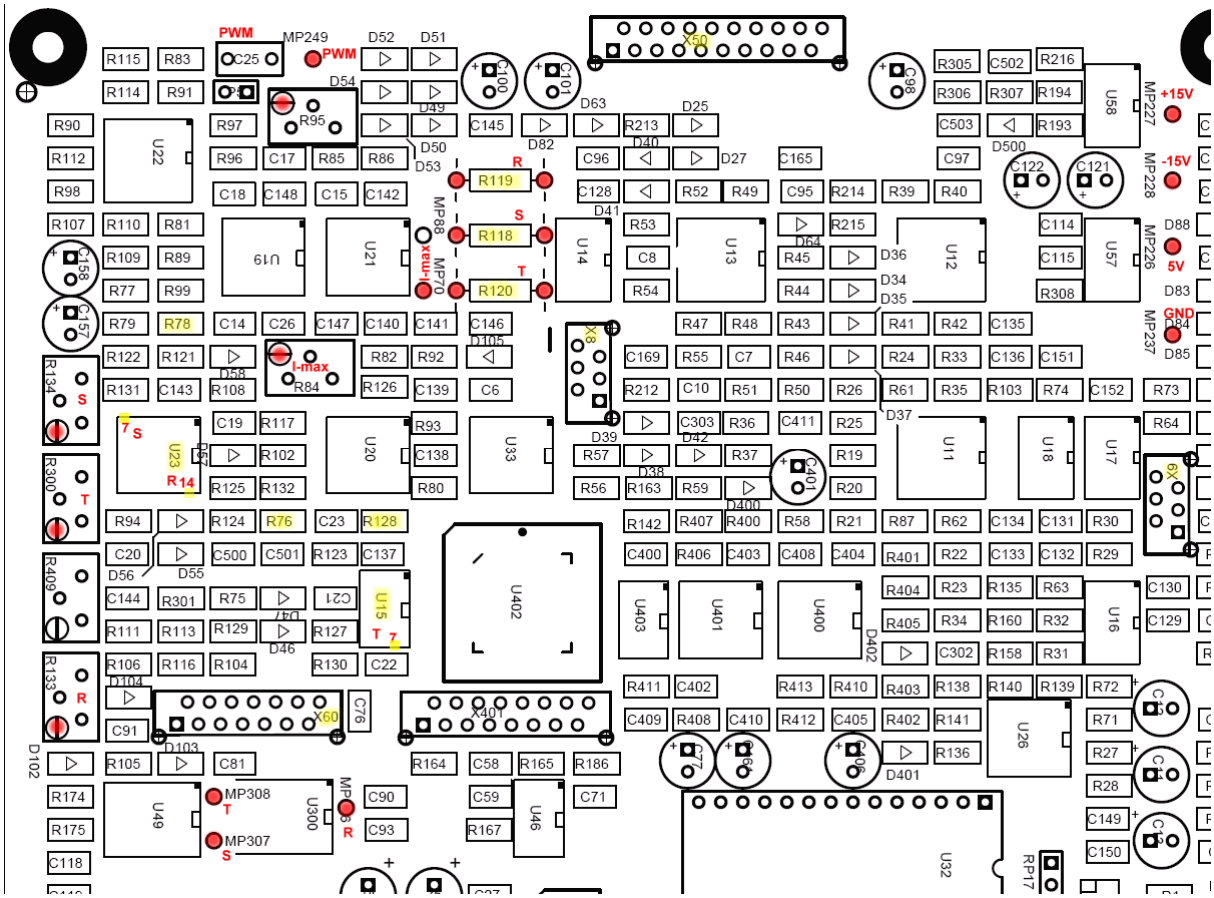
example for CNYD 60A or Europe 80A: see partlist C34L50G2

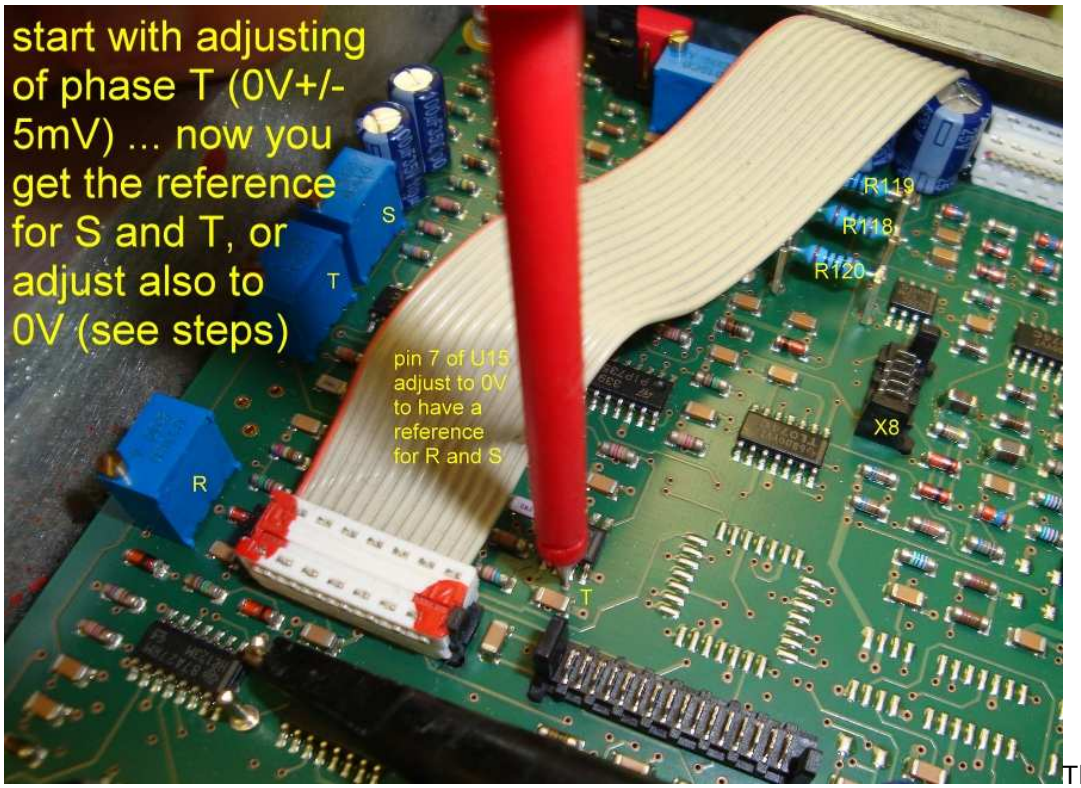
4GB

Table of values for 0E30/0E32/F24 (60MHz+SMD-FUC)

2.4 Simplified or changed steps to adjust for higher current-quality of 60MHz:

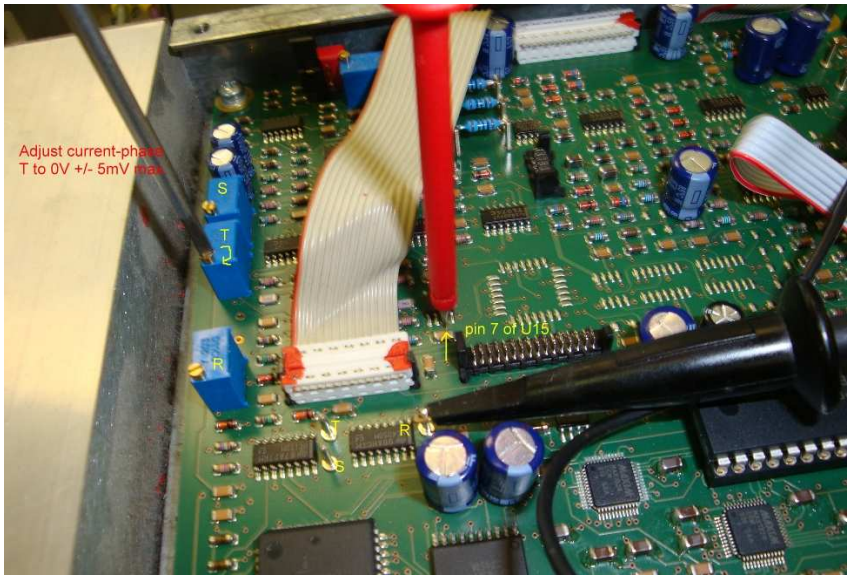
a) Adjusting current-regulator phase 'T' (Note: Phase 'T' not adjusted using 40MHz or 50MHz)



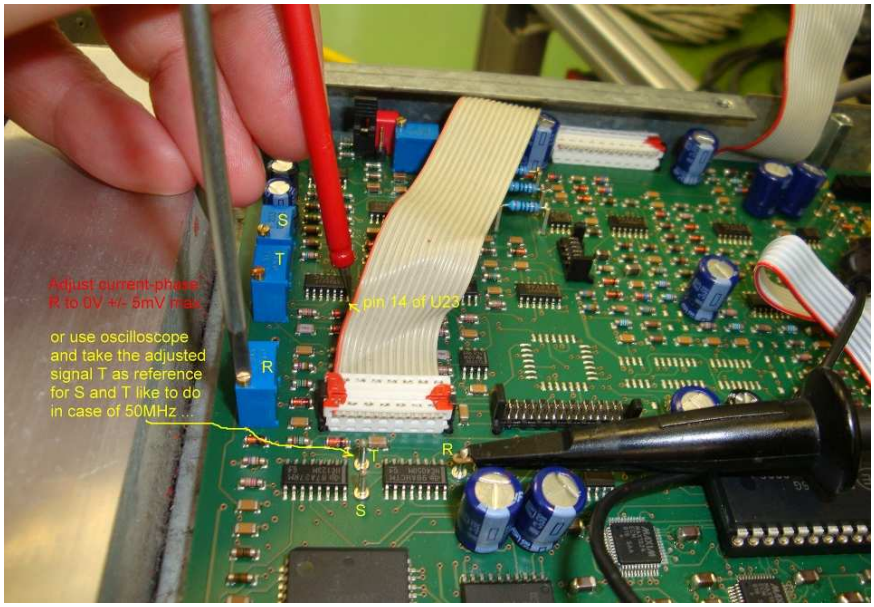


The phase T has to be measured at pin 7 IC u15 (through-hole) against point mp237 (gnd): Set it to 0V±5mV (r300)!

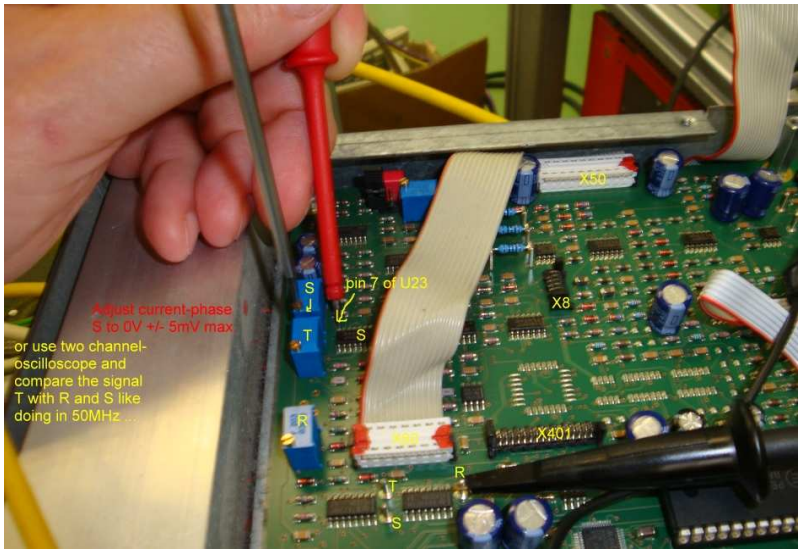
Next you can use your traditional procedures to measure or adjusting the phases 'R' and 'S' using an oscilloscope, but now we recommended adjusting phases 'R' and 'S' using same procedure as for 'T':



phase T, pin 7 u15, r300

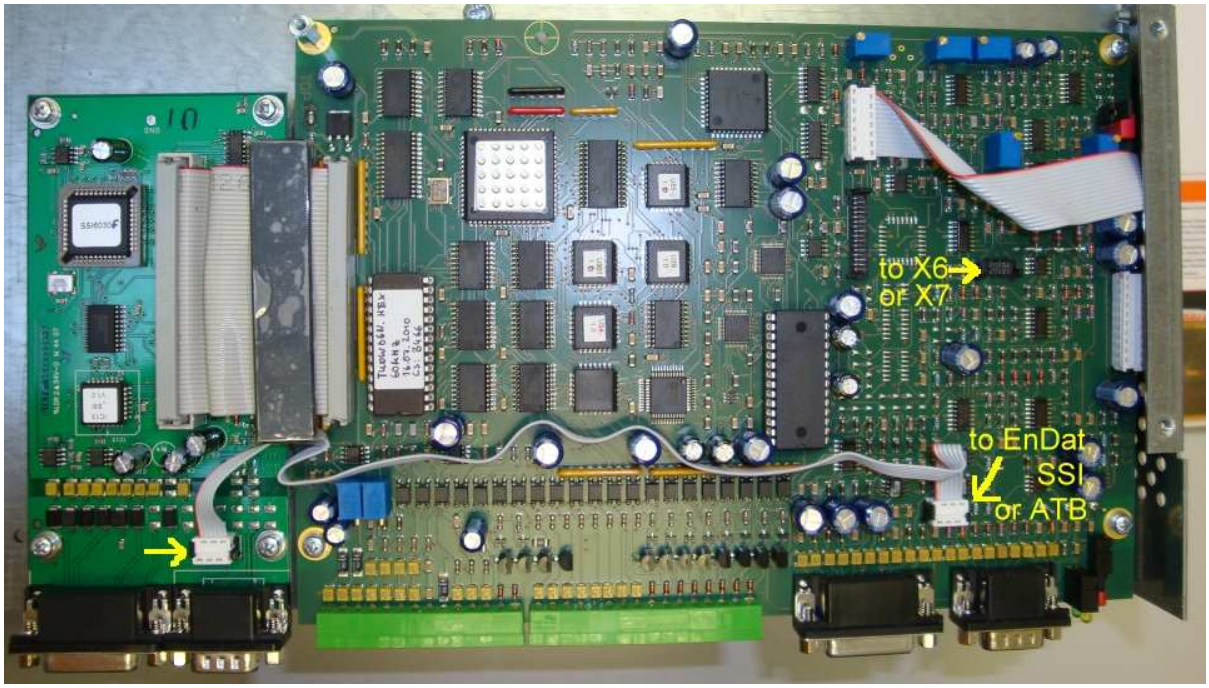


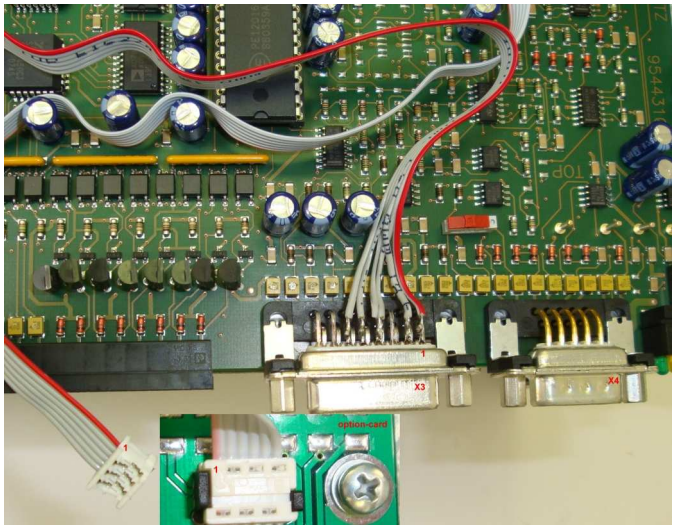
phase R, pin 14 u23, r133



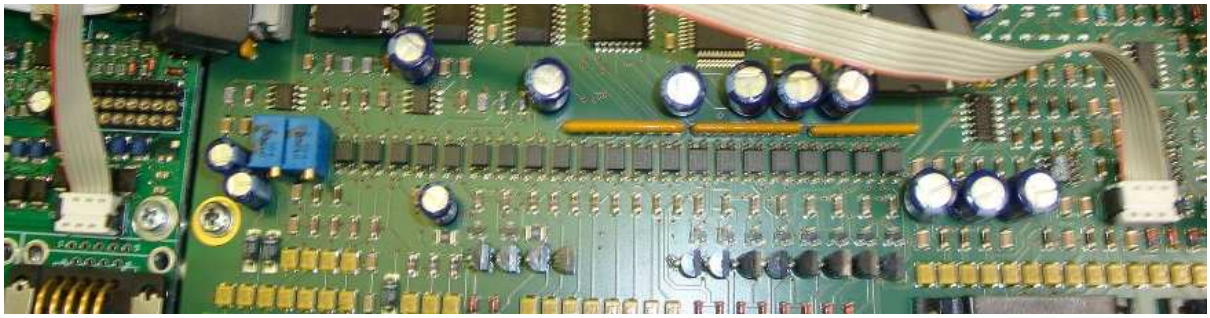
phase S, pin 7 u23, r134

b) Simplified changing and connecting using the new MIC-connector 'X9' on '60-MHz'-boards:





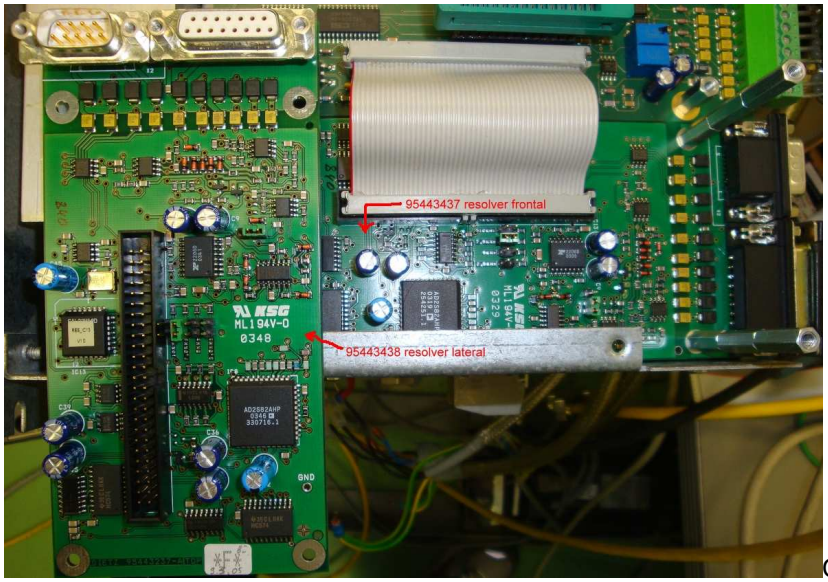
Old method of connecting SSI, EnDat, ATB !



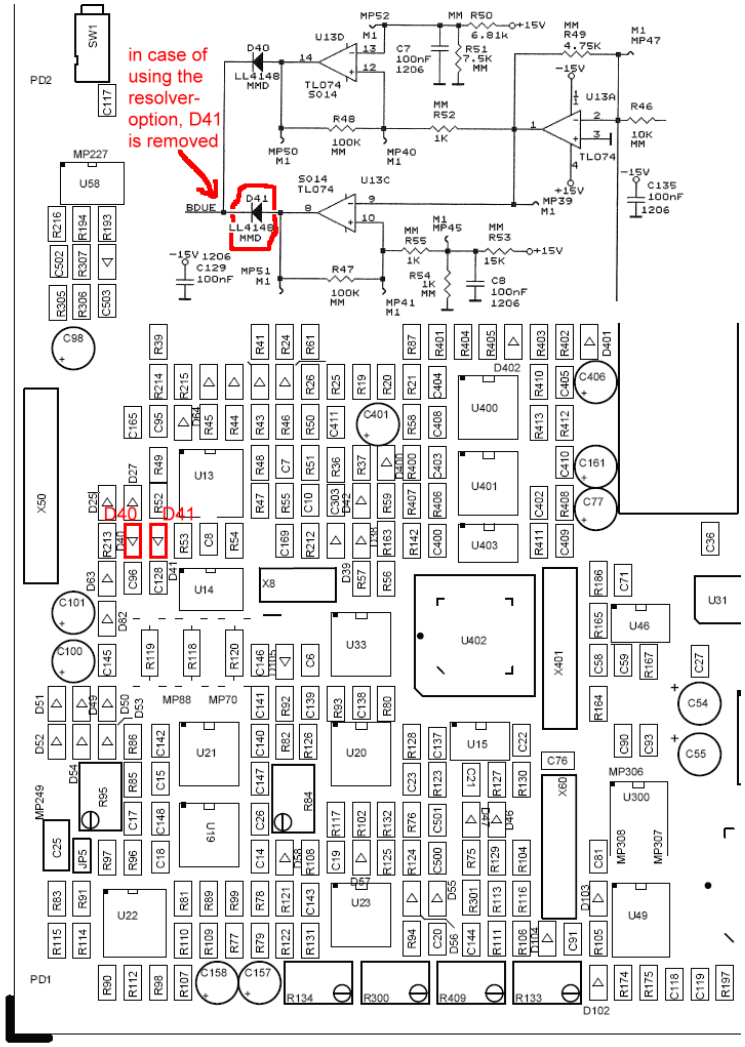
New method by using MIC-connection (same flat-cable as used for connecting to option-cards X6 / X7)

Important new pin-assignment of connector 'X8' in 60MHz-boards: Now pin 6 is connected to 5V (instead 'gnd', like 40/50MHz-board). That's ok for new option 'X7' (not ok for an old 'X6')!

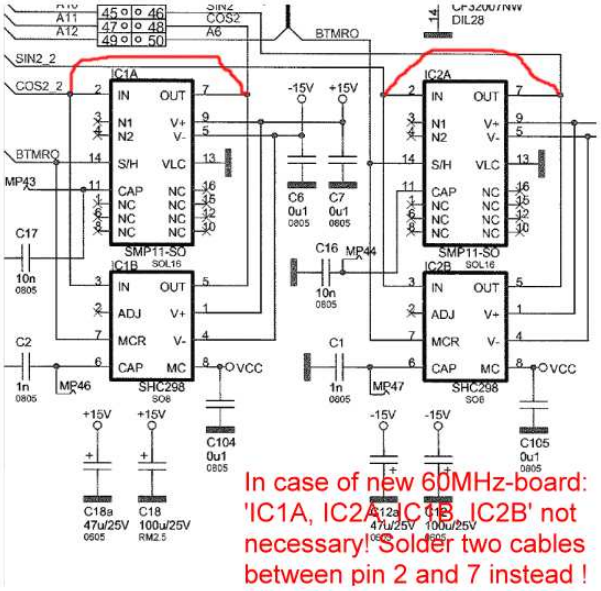
c) In case of using option-cards 'resolver' (for ECD-/EPM-winches or industrial-servo-motors):



Option 95443437 and 95443438!



Diode D41 is removed (X3 not in use)!



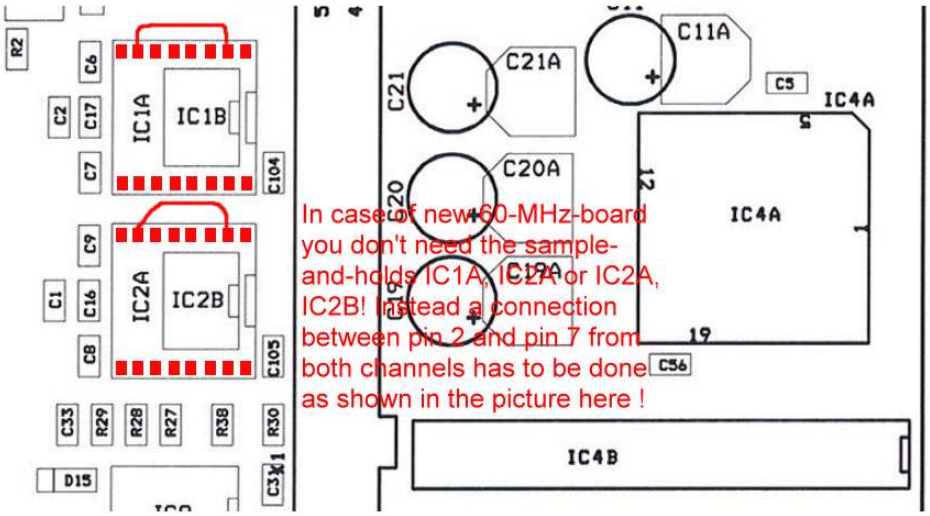
Additional instruction for board Index-C/D:

95445435 and 95445436

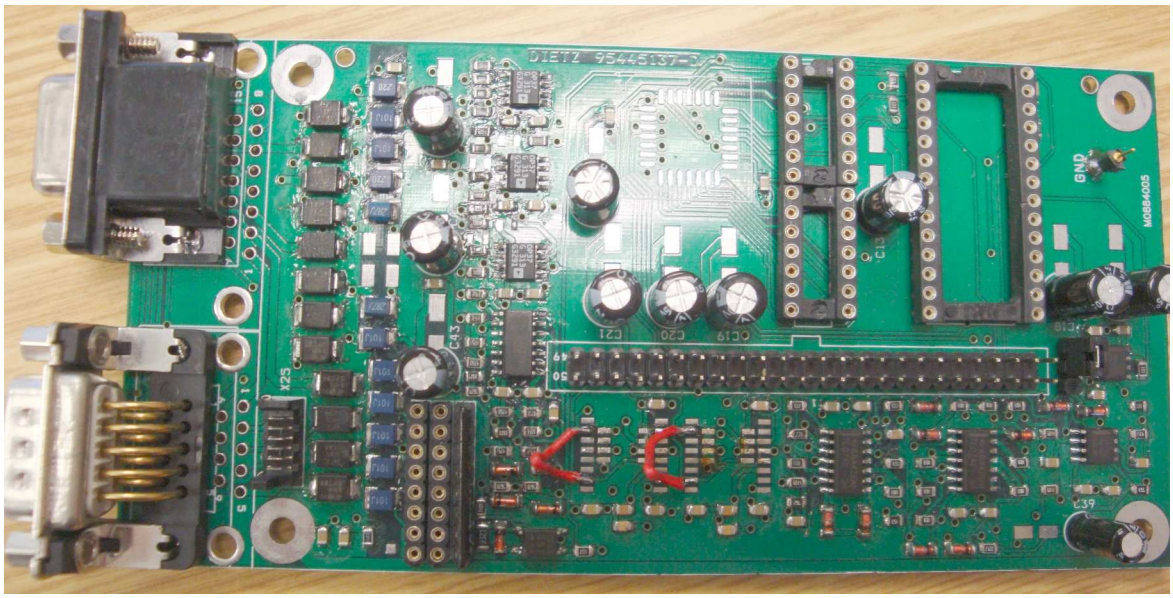
in case of using the new 60-MHz-board!

The 'Sample and Holds' no longer needed in partlists

New board also runs without the IC1A,B, IC2A,B, if pins 2 and 7 are connected together instead



No IC1/2 at 60MHz



Sample-and-holds IC1/2 will be not in placed in case of 60-MHz-boards (input connected to output)!