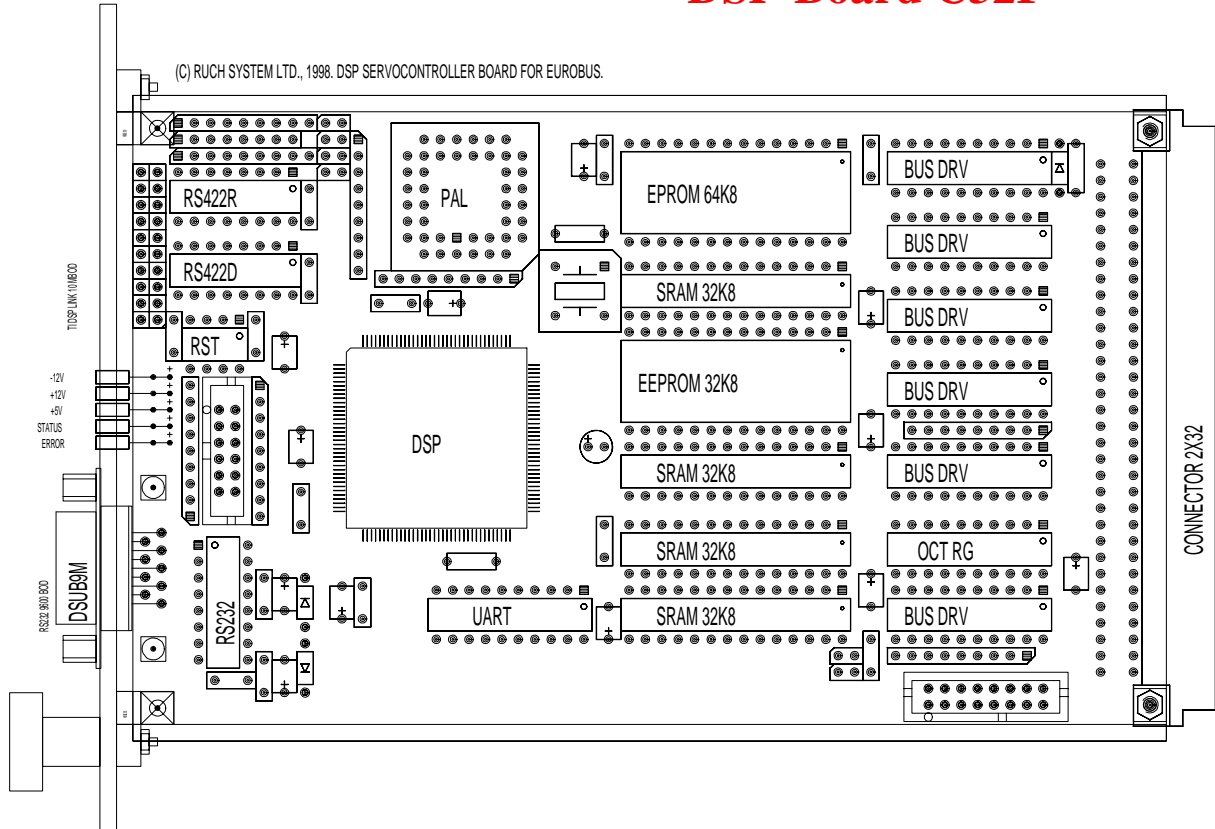


# NEW

# RUCH LTD

## DSP-Board C32F



### • Features for DSP Board C32F

- Euro-board 160 x 100 mm, Eurobus connection with 64 pin connector
- DSP TMS320C32, 60 MHz, 30 Mflops, Float Point commands, 2 Timers, 2 DMA, programmable Wait States, Boot from ROM, Boot from Link.
- 512K x 16 Bit Flash, 256K x 32 Bit zero wait states SRAM, 64K x 16 Bit Ports
- Serial interface RS232, standard D-Sub-9M connector on front panel
- Serial synchronous interface RS422 TI 10 Mbod for connecting multiple boards C32F
- 8 TTL Inputs, 6 TTL Outputs
- Watchdog
- LEDs for Status, Error, power supply 5V, 12V on front panel
- Multiple boards on one Bus possible
- Timer signal on Bus
- ROM-Software for linear and circle interpolation, 3 Axes, DIN/ISO or HPGL

## Pin assignment for DSP Board C32

*Bus connector P1 DIN41612 Type C 64 way plug, rows a/c, Front view*

		<b>C</b>			<b>A</b>		
+5V supply voltage	+5V	<b>01</b>	⊙	⊙	<b>01</b>	+5V	+5V supply voltage
+12V supply voltage	+12V	<b>02</b>	⊙	⊙	<b>02</b>	+12V	+12V supply voltage
-12V supply voltage	-12V	<b>03</b>	⊙	⊙	<b>03</b>	-12V	-12V supply voltage
Data bus bit D01	<i>D01</i>	<b>04</b>	⊙	⊙	<b>04</b>	<i>D00</i>	Data bus bit D00
Data bus bit D03	<i>D03</i>	<b>05</b>	⊙	⊙	<b>05</b>	<i>D02</i>	Data bus bit D02
Data bus bit D05	<i>D05</i>	<b>06</b>	⊙	⊙	<b>06</b>	<i>D04</i>	Data bus bit D04
Data bus bit D07	<i>D07</i>	<b>07</b>	⊙	⊙	<b>07</b>	<i>D06</i>	Data bus bit D06
Address bus bit A01	<i>A01</i>	<b>08</b>	⊙	⊙	<b>08</b>	<i>A00</i>	Address bus bit A00
Address bus bit A03	<i>A03</i>	<b>09</b>	⊙	⊙	<b>09</b>	<i>A02</i>	Address bus bit A02
Address bus bit A05	<i>A05</i>	<b>10</b>	⊙	⊙	<b>10</b>	<i>A04</i>	Address bus bit A04
Address bus bit A07	<i>A07</i>	<b>11</b>	⊙	⊙	<b>11</b>	<i>A06</i>	Address bus bit A06
Address bus bit A09	<i>A09</i>	<b>12</b>	⊙	⊙	<b>12</b>	<i>A08</i>	Address bus bit A08
Address bus bit A11	<i>A11</i>	<b>13</b>	⊙	⊙	<b>13</b>	<i>A10</i>	Address bus bit A10
Address bus bit A13	<i>A13</i>	<b>14</b>	⊙	⊙	<b>14</b>	<i>A12</i>	Address bus bit A12
Address bus bit A15	<i>A15</i>	<b>15</b>	⊙	⊙	<b>15</b>	<i>A14</i>	Address bus bit A14
Data bus bit D09	<i>D09</i>	<b>16</b>	⊙	⊙	<b>16</b>	<i>D08</i>	Data bus bit D08
Data bus bit D11	<i>D11</i>	<b>17</b>	⊙	⊙	<b>17</b>	<i>D10</i>	Data bus bit D10
Data bus bit D13	<i>D13</i>	<b>18</b>	⊙	⊙	<b>18</b>	<i>D12</i>	Data bus bit D12
Data bus bit D15	<i>D15</i>	<b>19</b>	⊙	⊙	<b>19</b>	<i>D14</i>	Data bus bit D14
Not connected	<i>NC</i>	<b>20</b>	⊙	⊙	<b>20</b>	<i>NC</i>	Not connected
Clock DSPCLK/2	<i>C20</i>	<b>21</b>	⊙	⊙	<b>21</b>	<i>EXT</i>	External address, active low
Write strobe, active low	<i>IOW</i>	<b>22</b>	⊙	⊙	<b>22</b>	<i>C05</i>	Clock DSPCLK/5
Read strobe, active low	<i>IOR</i>	<b>23</b>	⊙	⊙	<b>23</b>	<i>DTA</i>	Valid data, active low
Reset output, active low	<i>RST</i>	<b>24</b>	⊙	⊙	<b>24</b>	<i>RSI</i>	Reset input, active low
Read high, write low	<i>RW</i>	<b>25</b>	⊙	⊙	<b>25</b>	<i>VMA</i>	Valid address, active low
Not connected	<i>NC</i>	<b>26</b>	⊙	⊙	<b>26</b>	<i>NC</i>	Not connected
Not connected	<i>NC</i>	<b>27</b>	⊙	⊙	<b>27</b>	<i>NC</i>	Not connected
Not mask interrupt, active low	<i>NMI</i>	<b>28</b>	⊙	⊙	<b>28</b>	<i>IRQ</i>	Interrupt request, active low
Not connected	<i>NC</i>	<b>29</b>	⊙	⊙	<b>29</b>	<i>NC</i>	Not connected
Timer pulse positive	<i>TBP</i>	<b>30</b>	⊙	⊙	<b>30</b>	<i>TBM</i>	Timer pulse negative
Not connected	<i>NC</i>	<b>31</b>	⊙	⊙	<b>31</b>	<i>NC</i>	Not connected
Ground	<i>GND</i>	<b>32</b>	⊙	⊙	<b>32</b>	<i>GND</i>	Ground

## Pin assignment for DSP Board C32F

*P3 RS232 9 pins D-Sub-9M Male, front view*

Data set ready in NC	<i>DSR</i>	<b>06</b>	⊙	⊙	<b>01</b>	<i>DCD</i>	Data carrier detect in NC
Ready to send out	<i>RTS</i>	<b>07</b>	⊙	⊙	<b>02</b>	<i>RXD</i>	Receive data in
Clear to send in	<i>CTS</i>	<b>08</b>	⊙	⊙	<b>03</b>	<i>TXD</i>	Transmit data out
Ring indicator in (tied to +5V)	<i>RI</i>	<b>09</b>	⊙	⊙	<b>04</b>	<i>DTR</i>	Data terminal ready out NC
			⊙	⊙	<b>05</b>	<i>GND</i>	Ground

*P4 Link connector T&B IDC-20M 20 pins male, front view*

Output timer positive	<i>TQP</i>	<b>01</b>	⊙	⊙	<b>02</b>	<i>TQM</i>	Output timer negative
Data transmitter positive	<i>DTP</i>	<b>03</b>	⊙	⊙	<b>04</b>	<i>DTM</i>	Data transmitter negative
Frame transmitter negative	<i>FTM</i>	<b>05</b>	⊙	⊙	<b>06</b>	<i>FTP</i>	Frame transmitter positive
Clock transmitter negative	<i>CTM</i>	<b>07</b>	⊙	⊙	<b>08</b>	<i>CTP</i>	Clock transmitter positive
Ground digital	<i>GND</i>	<b>09</b>	⊙	⊙	<b>10</b>	<i>GND</i>	Ground digital
Ground digital	<i>GND</i>	<b>11</b>	⊙	⊙	<b>12</b>	<i>GND</i>	Ground digital
Clock receiver positive	<i>CRP</i>	<b>13</b>	⊙	⊙	<b>14</b>	<i>CRM</i>	Clock receiver negative
Frame receiver positive	<i>FRP</i>	<b>15</b>	⊙	⊙	<b>16</b>	<i>FRM</i>	Frame receiver negative
Data receiver negative	<i>DRM</i>	<b>17</b>	⊙	⊙	<b>18</b>	<i>DRP</i>	Data receiver positive
Timer input negative	<i>TIM</i>	<b>19</b>	⊙	⊙	<b>20</b>	<i>TIP</i>	Timer input positive

*P5 I/O TTL connector T&B IDC-16M 16 pins male, front view*

+5V supply voltage	<i>+5V</i>	<b>01</b>	⊙	⊙	<b>02</b>	<i>GND</i>	Ground
Input 8	<i>IN8</i>	<b>03</b>	⊙	⊙	<b>04</b>	<i>IN7</i>	Input 7
Input 6	<i>IN6</i>	<b>05</b>	⊙	⊙	<b>06</b>	<i>IN5</i>	Input 5
Input 4	<i>IN4</i>	<b>07</b>	⊙	⊙	<b>08</b>	<i>IN3</i>	Input 3
Input 2	<i>IN2</i>	<b>09</b>	⊙	⊙	<b>10</b>	<i>IN1</i>	Input 1
Output 3	<i>OT3</i>	<b>11</b>	⊙	⊙	<b>12</b>	<i>OT4</i>	Output 4
Output 5	<i>OT5</i>	<b>13</b>	⊙	⊙	<b>14</b>	<i>OT6</i>	Output 6
Output 7	<i>OT7</i>	<b>15</b>	⊙	⊙	<b>16</b>	<i>OT8</i>	Output 8

*P7 Simulator XDS510 MPSD connector T&B IDC-12M 12 pins male, front view*

Emulation pin 1	<i>EM1</i>	<b>01</b>	⊙	⊙	<b>02</b>	<i>GND</i>	Ground digital
Emulation pin 0	<i>EM0</i>	<b>03</b>	⊙	⊙	<b>04</b>	<i>GND</i>	Ground digital
Emulation pin 2	<i>EM2</i>	<b>05</b>	⊙	⊙	<b>06</b>	<i>GND</i>	Ground digital
Presence detect, tied to VCC	<i>+5V</i>	<b>07</b>	⊙	⊙	<b>08</b>	<i>KEY</i>	No Pin (key), tied to GND
Emulation pin 3	<i>EM3</i>	<b>09</b>	⊙	⊙	<b>10</b>	<i>GND</i>	Ground digital
Clock H3 from C32	<i>CH3</i>	<b>11</b>	⊙	⊙	<b>12</b>	<i>GND</i>	Ground digital



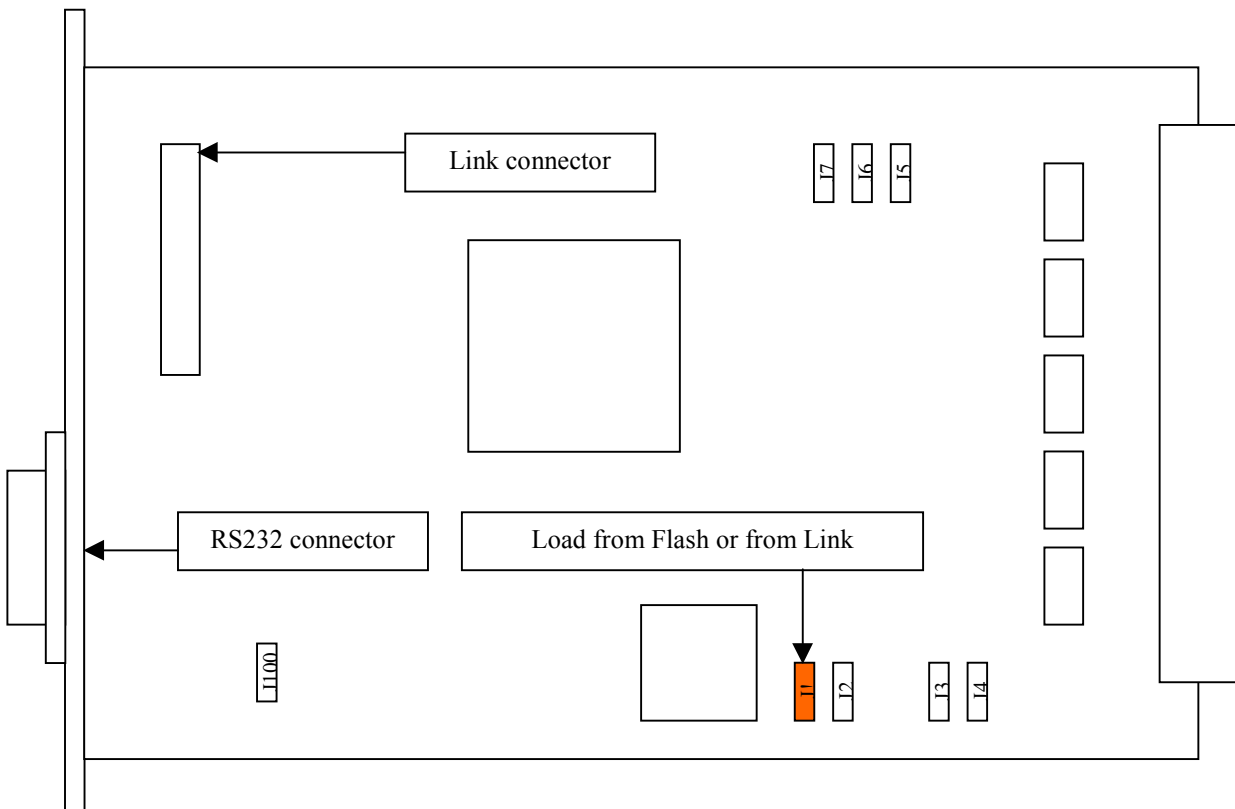
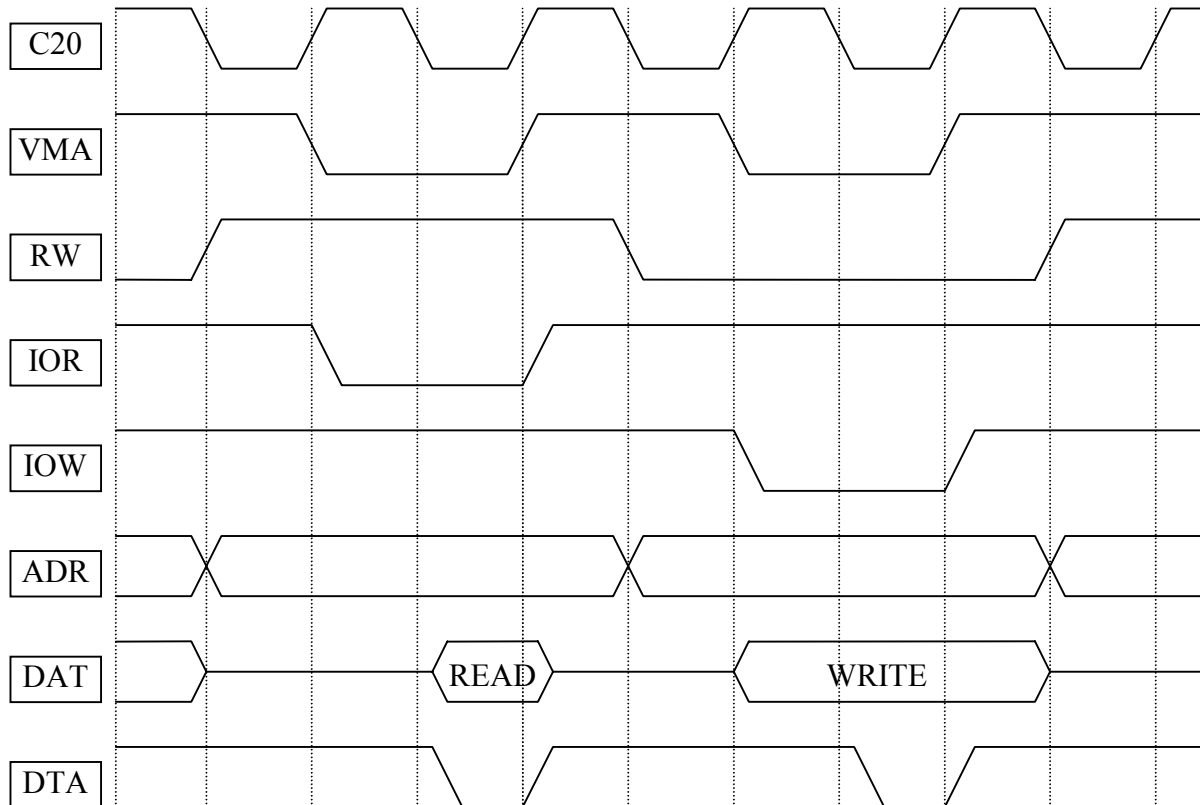
Recommended screened cable COM Port PC <-----> RS232 DS

D-Sub-9F	Pin	Cable COM PC <-> RS232 DSP	Pin	D-Sub-9F
RXD	2	>-----<	3	TXD
TXD	3	>-----<	2	RXD
GND	5	>-----<	5	GND
RTS	7	>-----<	8	CTS
CTS	8	>-----<	7	RTS
DTR	4	> [ ] <	4	DTR
DSR	6	> [ ] <	6	DSR

Recommended ribbon cable DSP Link <-----> LPT Port PC

IDC-20F	Pin	Cable DSP LINK <-> LPT PC	Pin	D-Sub-25M
GND	9	>----->	25	GND
GND	10	>----->	25	GND
GND	11	>----->	25	GND
GND	12	>----->	25	GND
CRP	13	>----->	07	DD5
CRM	14	>----->	06	DD4
FRP	15	>----->	05	DD3
FRM	16	>----->	04	DD2
DRP	17	>----->	03	DD1
DRM	18	>----->	02	DD0

## DSP C32F Board bus timing, Zero Wait-State Read and Write Sequence



## Reserved address for external bus of board DSP C32F

Address	RW	Boards
810180-81018F	RW	IO16 Inputs
8101C0-8101CF	RW	IO16 Outputs
810FF0-810FFF	RW	UC48
810FE0-810FE7	RW	IDP4
810040-810058	RW	AIF 1
810080-810098	RW	AIF 2
82FFF0-82FFF1	RW	COM

### Memory map for DSP C32F Board

From Addr	To Addr	Destination	Attr	Probe
000000	000FFF	Reserved for Boot Loader		
<b>100000</b>	<b>13FFFF</b>	<b>RAM (256 K x 32 Bit Words)</b>	<b>RW</b>	<b>S00</b>
140000	7FFFFFFF	Copies of RAM		S00
800000	807FFF	Reserved		-
808000	80800F	DMA Channel 0	RW	-
808010	80801F	DMA Channel 1	RW	-
808020	80802F	Timer 0	RW	-
808030	80803F	Timer 1	RW	-
808040	80804F	Serial Port 0 (Link)	RW	-
808050	80805F	Reserved		-
808060	808060	IOSTRB Control RG	RW	-
808061	808063	Reserved	RW	-
808064	808064	STRB0 Control RG	RW	-
808065	808067	Reserved	RW	-
808068	808068	STRB1 Control RG	RW	-
808069	80806F	Reserved	RW	-
808070	8097FF	Reserved		-
809800	80FFFF	Reserved 32 K		-
<b>810000</b>	<b>81FFFF</b>	<b>External Bus 64K x 16 Bit</b>	<b>RW</b>	<b>SIO</b>
82FFF0	82FFF1	<b>COM Port</b>	<b>RW</b>	<b>SIO</b>
830000	87FDFE	Reserved		-
87FE00	87FFFF	Internal 0-WS RAM 512 x 32 Bit	RW	-
<b>900000</b>	<b>9FFFFFFF</b>	<b>Flash memory 1M x 16 Bit</b>	<b>RW</b>	<b>S10</b>
<b>A10000</b>	<b>A10000</b>	<b>TTL Inputs (R) and Outputs (W)</b>	<b>RW</b>	<b>S10</b>

R-Read, W-Write, WS-Wait states

### Bus Bit-Map for DSP board C32F

				BYTE 3	BYTE 2	BYTE 1	BYTE 0
EXT RAM	100000	13FFFF	RW	<b>OFF-CHIP RAM</b>			
EXT PORTS	810000	81FFFF	RW	NOT USED		<b>EXTERNAL PORTS</b>	
INT RAM	87FE00	87FFFF	RW	<b>ON-CHIP RAM</b>			
FLASH	900000	9FFFFFFF	R	NOT USED		<b>FLASH</b>	
OUTPUTS	A10000	A10000	W	NOT USED	<b>OUTPUTS</b>	NOT USED	
INPUTS	A10000	A10000	R	<b>INPUTS</b>		NOT USED	
COM	82FFF0	82FFF0	RW	<b>COM DATA</b>	NOT USED		
COM	82FFF1	82FFF1	RW	<b>COM STAT</b>	NOT USED		