SER5
serial interfaces through software with internal Timer

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SER5 - Serial interfaces through software with internal Timer

This device driver enables up to two asynchronous serial inputs and outputs on internal I/O-pins. The interface has been implemented purely in the software. When installing the driver the file name determines at which pins the serial input and output takes place. The baud rate is determined by an internal timer, so **TIMERA is not used for these drivers**.

The driver can be set to individual requirements:

- RxD + TxD: activate/deactivate individual channels.
- RxD + TxD: each with 256, 1024 or 4096 byte FiFo buffer.
- RxD + TxD: with flow control: RTS / CTS activate/deactivate.
- TxD: RS-485 bus access control TE activate/deactivate.
- Data-Bits: Data format: 1...8 Bits.
- Parity-Bit: No, Even, Odd, Mark, Space.
- Baud rates: quasi-infinitely variable baud rates
- Level: TRUE + INVERSE level possible for RS-232 with/without power driver.
- PINs: RxD, TxD, RTS, CTS and TE can be laid to almost any I/O-pin of the Tiger.
- Unused pins of SER5 can be individually used as I/O's or for other device drivers.

Note: SER5_XX.TD2 puts much more strain on the CPU than a driver such as SER1B_xx.TD2 since several System-Task calls are carried out for every single bit. The following should therefore be taken into account when using this driver:

- only use SER5 if sufficient CPU performance is available.
- do not select too high a total baud rate for all RxD and TxD channels:
- The Debug function can be impaired with a higher CPU work-load.

The device driver can only be installed once, but it is possible to install SER5_pp_xx.TD2 and SER5B_pp_xx.TD2 together. With this combination it is possible to use up to 4 extra serial interfaces without TIMERA.

File name: SER5_pp_xx.TD2
SER5B_pp_xx.TD2

INSTALL DEVICE #D, "SER5_pp_xx.TD2", P1,...P9
INSTALL DEVICE #D, "SER5B_pp_xx.TD2", P1,...P9

D	is a constant, variable or expression of the data type BYTE, WORD, LONG in the range 0...63 and stands for the device number of the driver.
pp	in the file name stands for the position of the first pin (Port,Pin). A table further below in the text shows the location of the pins arising from the selection of the device driver.
xx	determines the buffer size: R1 = 256 Bytes, K1 = 1KByte, K4 = 4Kbyte.
P1...P10	the following table shows the meaning of the parameters P1 to P10:

	leave unchanged	Description of the parameter
P1	0EEH	is a parameter to determine the number of data bits. Value: 1...8 (Default: 8)
P2	0EEH	is a parameter to determine the parity: 0 = NO (Default) 1 = SPACE 2 = Even 3 = Odd 4 = MARK
P3	0EEH	0 = TRUE (Default) 1 = INVERS
P4	-	Transmitter Pre-Scaler 0 = no Transmitter present 1 = without Prescaler 2...255 = Prescaler Factor (Default: 3)
P5	-	Receive Oversample 0,1,2 = no Receiver present 3...255 = Oversample-Factor (Default: 3)
P6	-	Reserved, always 1.
P7	0EEH	Hardware-Handshake Pins: lower 3 Bits: 000 = no Handshake-Pins (Default) 001 = CTS-Pin (input, controls send activity) 010 = RTS-Pin (output, shows whether RxD has space in the buffer) 011 = RTS+CTS 100 = Transmitter-Enable f. RS-485 (output, shows whether data in TxD buffer)
P8	0EEH	Clock select: **SER5_pp_xx.TD2:** 1: ΦT1 2: ΦT4 (Default) 3: ΦT16 **SER5B_pp_xx.TD2:** 1: ΦT1 2: ΦT16 (Default) 3: ΦT256

	leave unchanged	Description of the parameter
P9	-	Divisor factor: is a parameter to determine the factor by which the basic clock pulse is divided (Default: 173)
P10	0EEH	Channel select: 0: single channel mode (only first channel is used) 1: multi channel mode (both channels are used) (Default)

The device driver uses up to eight I/O-pins which can be laid almost at random on the internal I/O pins of the Tiger module. The following table shows which assignments are possible by selecting the suitable driver file:

Driver name	CTS-0 (in) or TE (out)	RTS-0 (out)	TxD-0 (out)	RxD-01 (in)	TxD-1 (out)	RxD-1 (in)	CTS-1 (in) or TE (out)	RTS-1 (out)
SER5_80_xx.TD2	L80	L81	L82	L83	L84	L85	L86	L87
SER5_81_xx.TD2	L81	L82	L83	L84	L85	L86	L87	L70
SER5_82_xx.TD2	L82	L83	L84	L85	L86	L87	L70	L71
SER5_83_xx.TD2	L83	L84	L85	L86	L87	L70	L71	L72
SER5_84_xx.TD2	L84	L85	L86	L87	L70	L71	L72	L73
SER5_85_xx.TD2	L85	L86	L87	L70	L71	L72	L73	L74
SER5_86_xx.TD2	L86	L87	L70	L71	L72	L73	L74	L75
SER5_87_xx.TD2	L87	L70	L71	L72	L73	L74	L75	L76
SER5_70_xx.TD2	L70	L71	L72	L73	L74	L75	L76	L77
SER5_71_xx.TD2	L71	L72	L73	L74	L75	L76	L77	L60
SER5_72_xx.TD2	L72	L73	L74	L75	L76	L77	L60	L61
SER5_73_xx.TD2	L73	L74	L75	L76	L77	L60	L61	L62
SER5_74_xx.TD2	L74	L75	L76	L77	L60	L61	L62	L63
SER5_75_xx.TD2	L75	L76	L77	L60	L61	L62	L63	L64
SER5_76_xx.TD2	L76	L77	L60	L61	L62	L63	L64	L65
SER5_77_xx.TD2	L77	L60	L61	L62	L63	L64	L65	L66
SER5_60_xx.TD2	L60	L61	L62	L63	L64	L65	L66	L67
SER5_61_xx.TD2	L61	L62	L63	L64	L65	L66	L67	L40
SER5_62_xx.TD2	L62	L63	L64	L65	L66	L67	L40	L42
SER5_63_xx.TD2	L63	L64	L65	L66	L67	L40	L42	L33
SER5_64_xx.TD2	L64	L65	L66	L67	L40	L42	L33	L34
SER5_65_xx.TD2	L65	L66	L67	L40	L42	L33	L34	L35
SER5_66_xx.TD2	L66	L67	L40	L42	L33	L34	L35	L36
SER5_67_xx.TD2	L67	L40	L42	L33	L34	L35	L36	L37
SER5_40_xx.TD2	L40	L42	L33	L34	L35	L36	L37	L70
SER5_42_xx.TD2	L42	L33	L34	L35	L36	L37	L70	L71
SER5_33_xx.TD2	L33	L34	L35	L36	L37	L70	L71	L72
SER5_34_xx.TD2	L34	L35	L36	L37	L70	L71	L72	L73
SER5_35_xx.TD2	L35	L36	L37	L70	L71	L72	L73	L74

Driver name	CTS-0 (in) or TE (out)	RTS-0 (out)	TxD-0 (out)	RxD-01 (in)	TxD-1 (out)	RxD-1 (in)	CTS-1 (in) or TE (out)	RTS-1 (out)
SER5_36_xx.TD2	L36	L37	L70	L71	L72	L73	L74	L75
SER5_37_xx.TD2	L37	L70	L71	L72	L73	L74	L75	L76
SER5_3672_xx.TD2	L36	L37	L72	L73	L74	L75	L70	L71

Setting the baud rate

According to the driver one of the following source clocks can be selected:

Clock	Frequency	Interval
ΦT1	2,500,000 Hz	400 ns
ΦT4	625,000 Hz	1.6 µs
ΦT16	156,250 Hz	6.4 µs
ΦT256	9765,625 Hz	102,4 µs

Please choose a divisor factor from the following table according to the selected clock:

Frequ.	Factor
ΦT1	
62.500	40
60.976	41
59.524	42
58.140	43
56.818	44
55.556	45
54.348	46
53.191	47
52.083	48
51.020	49
50.000	50
49.020	51
48.077	52
47.170	53
46.296	54
45.455	55
44.643	56
43.860	57
43.103	58
42.373	59
41.667	60
40.984	61
40.323	62
39.683	63
39.063	64
38.462	65
37.879	66
37.313	67
36.765	68
36.232	69
35.714	70

Frequ.	Factor
35.211	71
34.722	72
34.247	73
33.784	74
33.333	75
32.895	76
32.468	77
32.051	78
31.646	79
31.250	80
30.864	81
30.488	82
30.120	83
29.762	84
29.412	85
29.070	86
28.736	87
28.409	88
28.090	89
27.778	90
27.473	91
27.174	92
26.882	93
26.596	94
26.316	95
26.042	96
25.773	97
25.510	98
25.253	99
25.000	100
24.752	101
24.510	102

Frequ.	Factor
24.272	103
24.038	104
23.810	105
23.585	106
23.364	107
23.148	108
22.936	109
22.727	110
22.523	111
22.321	112
22.124	113
21.930	114
21.739	115
21.552	116
21.368	117
21.186	118
21.008	119
20.833	120
20.661	121
20.492	122
20.325	123
20.161	124
20.000	125
19.841	126
19.685	127
19.531	128
19.380	129
19.231	130
19.084	131
18.939	132
18.797	133
18.657	134

Frequ.	Factor
18.519	135
18.382	136
18.248	137
18.116	138
17.986	139
17.857	140
17.730	141
17.606	142
17.483	143
17.361	144
17.241	145
17.123	146
17.007	147
16.892	148
16.779	149
16.667	150
16.556	151
16.447	152
16.340	153
16.234	154
16.129	155
16.026	156
15.924	157
15.823	158
15.723	159
15.625	160
15.528	161
15.432	162
15.337	163
15.244	164
15.152	165
15.060	166

Frequ.	Factor
14.970	167
14.881	168
14.793	169
14.706	170
14.620	171
14.535	172
14.451	173
14.368	174
14.286	175
14.205	176
14.124	177
14.045	178
13.966	179
13.889	180
13.812	181
13.736	182
13.661	183
13.587	184
13.514	185
13.441	186
13.369	187
13.298	188
13.228	189
13.158	190
13.089	191
13.021	192
12.953	193
12.887	194
12.821	195
12.755	196
12.690	197
12.626	198

Frequ.	Factor
12.563	199
12.500	200
12.438	201
12.376	202
12.315	203
12.255	204
12.195	205
12.136	206
12.077	207
12.019	208
11.962	209
11.905	210
11.848	211
11.792	212
11.737	213
11.682	214
11.628	215
11.574	216
11.521	217
11.468	218
11.416	219
11.364	220
11.312	221
11.261	222
11.211	223
11.161	224
11.111	225
11.062	226
11.013	227
10.965	228
10.917	229
10.870	230

Frequ.	Factor
10.823	231
10.776	232
10.730	233
10.684	234
10.638	235
10.593	236
10.549	237
10.504	238
10.460	239
10.417	240
10.373	241
10.331	242
10.288	243
10.246	244
10.204	245
10.163	246
10.121	247
10.081	248
10.040	249
10.000	250
9.960	251
9.921	252
9.881	253
9.843	254
9.804	255

Frequ.	Factor
ΦT4	
62.500	10
56.818	11
52.083	12
48.077	13
44.643	14
41.667	15
39.063	16
36.765	17
34.722	18
32.895	19
31.250	20
29.762	21
28.409	22
27.174	23
26.042	24
25.000	25
24.038	26
23.148	27
22.321	28
21.552	29
20.833	30
20.161	31
19.531	32
18.939	33
18.382	34
17.857	35
17.361	36
16.892	37
16.447	38
16.026	39
15.625	40

Frequ.	Factor
15.244	41
14.881	42
14.535	43
14.205	44
13.889	45
13.587	46
13.298	47
13.021	48
12.755	49
12.500	50
12.255	51
12.019	52
11.792	53
11.574	54
11.364	55
11.161	56
10.965	57
10.776	58
10.593	59
10.417	60
10.246	61
10.081	62
9.921	63
9.766	64
9.615	65
9.470	66
9.328	67
9.191	68
9.058	69
8.929	70
8.803	71
8.681	72

Frequ.	Factor
8.562	73
8.446	74
8.333	75
8.224	76
8.117	77
8.013	78
7.911	79
7.813	80
7.716	81
7.622	82
7.530	83
7.440	84
7.353	85
7.267	86
7.184	87
7.102	88
7.022	89
6.944	90
6.868	91
6.793	92
6.720	93
6.649	94
6.579	95
6.510	96
6.443	97
6.378	98
6.313	99
6.250	100
6.188	101
6.127	102
6.068	103
6.010	104

Frequ.	Factor
5.952	105
5.896	106
5.841	107
5.787	108
5.734	109
5.682	110
5.631	111
5.580	112
5.531	113
5.482	114
5.435	115
5.388	116
5.342	117
5.297	118
5.252	119
5.208	120
5.165	121
5.123	122
5.081	123
5.040	124
5.000	125
4.960	126
4.921	127
4.883	128
4.845	129
4.808	130
4.771	131
4.735	132
4.699	133
4.664	134
4.630	135
4.596	136

Frequ.	Factor
4.562	137
4.529	138
4.496	139
4.464	140
4.433	141
4.401	142
4.371	143
4.340	144
4.310	145
4.281	146
4.252	147
4.223	148
4.195	149
4.167	150
4.139	151
4.112	152
4.085	153
4.058	154
4.032	155
4.006	156
3.981	157
3.956	158
3.931	159
3.906	160
3.882	161
3.858	162
3.834	163
3.811	164
3.788	165
3.765	166
3.743	167
3.720	168

Frequ.	Factor
3.698	169
3.676	170
3.655	171
3.634	172
3.613	173
3.592	174
3.571	175
3.551	176
3.531	177
3.511	178
3.492	179
3.472	180
3.453	181
3.434	182
3.415	183
3.397	184
3.378	185
3.360	186
3.342	187
3.324	188
3.307	189
3.289	190
3.272	191
3.255	192
3.238	193
3.222	194
3.205	195
3.189	196
3.173	197
3.157	198
3.141	199
3.125	200

Frequ.	Factor
3.109	201
3.094	202
3.079	203
3.064	204
3.049	205
3.034	206
3.019	207
3.005	208
2.990	209
2.976	210
2.962	211
2.948	212
2.934	213
2.921	214
2.907	215
2.894	216
2.880	217
2.867	218
2.854	219
2.841	220
2.828	221
2.815	222
2.803	223
2.790	224
2.778	225
2.765	226
2.753	227
2.741	228
2.729	229
2.717	230
2.706	231
2.694	232

Frequ.	Factor
2.682	233
2.671	234
2.660	235
2.648	236
2.637	237
2.626	238
2.615	239
2.604	240
2.593	241
2.583	242
2.572	243
2.561	244
2.551	245
2.541	246
2.530	247
2.520	248
2.510	249
2.500	250
2.490	251
2.480	252
2.470	253
2.461	254
2.451	255

Frequ.	Factor
ΦT16	
52.083	3
39.063	4
31.250	5
26.042	6
22.321	7
19.531	8
17.361	9
15.625	10
14.205	11
13.021	12
12.019	13
11.161	14
10.417	15
9.766	16
9.191	17
8.681	18
8.224	19
7.813	20
7.440	21
7.102	22
6.793	23
6.510	24
6.250	25
6.010	26
5.787	27
5.580	28
5.388	29
5.208	30
5.040	31
4.883	32
4.735	33

Frequ.	Factor
4.596	34
4.464	35
4.340	36
4.223	37
4.112	38
4.006	39
3.906	40
3.811	41
3.720	42
3.634	43
3.551	44
3.472	45
3.397	46
3.324	47
3.255	48
3.189	49
3.125	50
3.064	51
3.005	52
2.948	53
2.894	54
2.841	55
2.790	56
2.741	57
2.694	58
2.648	59
2.604	60
2.561	61
2.520	62
2.480	63
2.441	64
2.404	65

Frequ.	Factor
2.367	66
2.332	67
2.298	68
2.264	69
2.232	70
2.201	71
2.170	72
2.140	73
2.111	74
2.083	75
2.056	76
2.029	77
2.003	78
1.978	79
1.953	80
1.929	81
1.905	82
1.883	83
1.860	84
1.838	85
1.817	86
1.796	87
1.776	88
1.756	89
1.736	90
1.717	91
1.698	92
1.680	93
1.662	94
1.645	95
1.628	96
1.611	97

Frequ.	Factor
1.594	98
1.578	99
1.563	100
1.547	101
1.532	102
1.517	103
1.502	104
1.488	105
1.474	106
1.460	107
1.447	108
1.433	109
1.420	110
1.408	111
1.395	112
1.383	113
1.371	114
1.359	115
1.347	116
1.335	117
1.324	118
1.313	119
1.302	120
1.291	121
1.281	122
1.270	123
1.260	124
1.250	125
1.240	126
1.230	127
1.221	128
1.211	129

Frequ.	Factor
1.202	130
1.193	131
1.184	132
1.175	133
1.166	134
1.157	135
1.149	136
1.141	137
1.132	138
1.124	139
1.116	140
1.108	141
1.100	142
1.093	143
1.085	144
1.078	145
1.070	146
1.063	147
1.056	148
1.049	149
1.042	150
1.035	151
1.028	152
1.021	153
1.015	154
1.008	155
1.002	156
995	157
989	158
983	159
977	160
970	161

Frequ.	Factor
965	162
959	163
953	164
947	165
941	166
936	167
930	168
925	169
919	170
914	171
908	172
903	173
898	174
893	175
888	176
883	177
878	178
873	179
868	180
863	181
859	182
854	183
849	184
845	185
840	186
836	187
831	188
827	189
822	190
818	191
814	192
810	193

Frequ.	Factor
805	194
801	195
797	196
793	197
789	198
785	199
781	200
777	201
774	202
770	203
766	204
762	205
758	206
755	207
751	208
748	209
744	210
741	211
737	212
734	213
730	214
727	215
723	216
720	217
717	218
713	219
710	220
707	221
704	222
701	223
698	224
694	225

Frequ.	Factor
691	226
688	227
685	228
682	229
679	230
676	231
673	232
671	233
668	234
665	235
662	236
659	237
657	238
654	239
651	240
648	241
646	242
643	243
640	244
638	245
635	246
633	247
630	248
628	249
625	250
623	251
620	252
618	253
615	254
613	255

Frequ.	Factor
ΦT256	
9.766	1
4.883	2
3.255	3
2.441	4
1.953	5
1.628	6
1.395	7
1.221	8
1.085	9
977	10
888	11
814	12
751	13
698	14
651	15
610	16
574	17
543	18
514	19
488	20
465	21
444	22
425	23
407	24
391	25
376	26
362	27
349	28
337	29
326	30
315	31

Frequ.	Factor
305	32
296	33
287	34
279	35
271	36
264	37
257	38
250	39
244	40
238	41
233	42
227	43
222	44
217	45
212	46
208	47
203	48
199	49
195	50
191	51
188	52
184	53
181	54
178	55
174	56
171	57
168	58
166	59
163	60
160	61
158	62
155	63

Frequ.	Factor
153	64
150	65
148	66
146	67
144	68
142	69
140	70
138	71
136	72
134	73
132	74
130	75
128	76
127	77
125	78
124	79
122	80
121	81
119	82
118	83
116	84
115	85
114	86
112	87
111	88
110	89
109	90
107	91
106	92
105	93
104	94
103	95

Frequ.	Factor
102	96
101	97
100	98
99	99
98	100
97	101
96	102
95	103
94	104
93	105
92	106
91	107
90	108
90	109
89	110
88	111
87	112
86	113
86	114
85	115
84	116
83	117
83	118
82	119
81	120
81	121
80	122
79	123
79	124
78	125
78	126
77	127

Frequ.	Factor
76	128
76	129
75	130
75	131
74	132
73	133
73	134
72	135
72	136
71	137
71	138
70	139
70	140
69	141
69	142
68	143
68	144
67	145
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66	148
66	149
65	150
65	151
64	152
64	153
63	154
63	155
63	156
62	157
62	158
61	159

Frequ.	Factor
61	160
61	161
60	162
60	163
60	164
59	165
59	166
58	167
58	168
58	169
57	170
57	171
57	172
56	173
56	174
56	175
55	176
55	177
55	178
55	179
54	180
54	181
54	182
53	183
53	184

Frequ.	Factor
53	185
53	186
52	187
52	188
52	189
51	190
51	191
51	192
51	193
50	194
50	195
50	196
50	197
49	198
49	199
49	200
49	201
48	202
48	203
48	204
48	205
47	206
47	207
47	208
47	209

Frequ.	Factor
47	210
46	211
46	212
46	213
46	214
45	215
45	216
45	217
45	218
45	219
44	220
44	221
44	222
44	223
44	224
43	225
43	226
43	227
43	228
43	229
42	230
42	231
42	232
42	233
42	234

Frequ.	Factor
42	235
41	236
41	237
41	238
41	239
41	240
41	241
40	242
40	243
40	244
40	245
40	246
40	247
39	248
39	249
39	250
39	251
39	252
39	253
38	254
38	255

As an example we want to generate a baud rate of 2.400 Bd with *SER5_80_R1.TD2.* We use a receive over sampling and a transmit pre-scaler of 3, so we need a frequency of about 7.200:

```
INSTALL_DEVICE #SER5,"SER5_80_R1.TD2", &
  8, &  ' databits
  0, &  ' parity 0=no parity
  0, &  ' invert 0=true, 1=inverse
  3, &  ' tx Prescaler
  3, &  ' rx Oversample
  1, &  ' reserved, always 1
  000b, &  ' handshake, 0=no handshake
  2, &  ' timer range
  87   ' divisor factor => 2.400 Bd
```

User-Function-Codes of the SER5_pp_xx.TD2

User-Function-Codes for inquiries (instruction GET):

No	Symbol Prefix UFCI_	Description
1	UFCI_IBU_FILL	No. of bytes in input buffer (Byte)
2	UFCI_IBU_FREE	Free space in input buffer (Byte)
3	UFCI_IBU_VOL	Size of input buffer (Byte)
33	UFCI_OBU_FILL	Number of bytes in output buffer (Byte)
34	UFCI_OBU_FREE	Free space in output buffer (Byte)
35	UFCI_OBU_VOL	Size of output buffer (Byte)
65	UFCI_LAST_ERRC	Last error code
99	UFCI_DEV_VERS	Driver version

If there is not enough space in the output buffer and you nevertheless wish to output the instruction PUT or Print (and thus the complete task) waits until space once again becomes free in the buffer.

Example: inquire the level of the output buffer to determine whether there is enough space for the output:

```
GET #2, #0, #UFCI_OBU_FILL, 0, wVarFill
IF wVarFill > (LEN(A$)+2) THEN     ' A$ + CR + LF
  PRINT #2, #0, A$
ENDIF
```

User-Function-Codes for the instruction PUT following command:

No	Symbol Prefix: UFCO_	Description
1	UFCO_IBU_ERASE	Delete input buffer
33	UFCO_OBU_ERASE	Delete output buffer
94	UFCO_SET_SERIAL	set serial parameter
128	UFCO_SET_ISEP	set limiter characters for instruction INPUT
129	UFCO_RES_ISEP	delete limiter characters for INPUT
130	UFCO_SET_BAUDRATE	Set new baud rate

Example: send data on channel 1 & 2:

```
PUT #SER5, #0, "Data on channel-0"
PUT #SER5, #1, "Data on channel-1"
```

Example: set new parameter on serial channel. The parameters will be output in the same way as in the INSTALL line, but only the first 5 parameters are authorised:

```
'                              data,par,inv,TxPre,RxOvs,-,handshake
PUT #SER5, #0, #UFCO_SET_SERIAL, 8,  3,  1,    3,    3,1,   0
```

Comma AND return ARE REGARDED AS SEPARATOR CHARACTERS BY DEFAULT FOR THE INSTRUCTION INPUT. THE SEPARATOR CHARACTERS CAN BE CHANGED USING THE USER-FUNCTION-CODE UFCO_SET_ISEP. BEFORE SETTING NEW CHARACTERS THE ALREADY SET CHARACTERS CAN BE DELETED. THE CHARACTERS TO BE SET OR DELETED ARE SPECIFIED AS CODE AREAS:

PUT #D, #C, UFCO_SET_ISEP, *Startcode*, *Endcode*, *Startcode*, *Endcode*

! If you delete the standard separators without setting new ones an INPUT instruction will only be terminated when the Input buffer is full.

Example: set new separator LINE-FEED for the instruction input on the serial channel 0:

```
PUT #2,#0, #UFCO_RES_ISEP, 0, 255       ' delete all separators
PUT #2,#0, #UFCO_SET_ISEP, 10, 10       ' set Line-Feed as separator
```

Example: set all control characters as well as characters as of 7Fh as separator characters for the instruction input on the serial channel 0:

```
PUT #2, #0, #UFCO_RES_ISEP, 0, 255      ' delete all separators
                                  ' set new code area as separators
PUT #2, #0, #UFCO_SET_ISEP, 0, 31, 127, 255
```

Example: delete comma as separator character for the instruction input on the serial channel 0:

```
PUT #2, #0, #UFCO_RES_ISEP, 2ch, 2ch    ' delete comma as separator
' oder
PUT #2, #0, #UFCO_RES_ISEP, ',,'        ' delete comma as separator
```

A further example:

```
PUT #1, #0, #UFCI_SET_ISEP, 'acXZ55'
' set as INPUT separators the following characters:
'               a, b, c, X, Y, Z, 5
```

Changing the baud rate

PUT #D, #0, #UFCO_SET_BAUDRATE, clock, factor

D is a constant, variable or an expression of data type WORD, LONG, BYTE in the range 0...63 and stands for the device number of the driver.

clock is a constant, variable or an expression of data type BYTE and contains the clock select:
SER5_pp_xx.TD2:
1:ΦT1
2:ΦT4
3:ΦT16
SER5B_pp_xx.TD2:
1:ΦT1
2:ΦT16
3:ΦT256.

factor is a constant, variable or an expression of data type BYTE and contains the Divisor factor. This parameter determines the factor by which the basic clock pulse is divided. For details read *setting the baud rate*.

Example:

```
PUT #SER5, #0, #UFCO_SET_BAUDRATE, 2, 87  ' set 2.400 Bd for SER5_pp_xx.TD2
```

Documentation History

Version of Documentation	Version of SER5	Description / Changes
002	1.00a	- first version
003	1.00a	- some phrasings changed
004	1.00a	- some phrasings changed
005	1.00a	- SER5_3672_xx.TD2
006	1.00b	- Install_device default values
007	1.00b	- Telephone number changed