

# 1 EMVerify Contactless

Legend: Tamarin Tamgram

	executable					bank_accepts				
Mastercard_CDA_NoPIN_High	falsified steps	47	47.6	falsified steps	48	49.2	×	-	×	-
Mastercard_CDA_NoPIN_Low	verified steps	30	55.2	verified steps	28	64.1	verified 2897 steps	719.9	verified 3629 steps	947.6
Mastercard_CDA_OnlinePIN_High	verified steps	30	57.7	verified steps	29	71.4	verified 7145 steps	1698.0	verified 9331 steps	2399.8
Mastercard_CDA_OnlinePIN_Low	verified steps	30	51.6	verified steps	28	61.3	verified 2905 steps	704.3	verified 3637 steps	956.9
Mastercard_DDA_NoPIN_High	falsified steps	49	45.7	falsified steps	50	46.9	×	-	×	-
Mastercard_DDA_NoPIN_Low	verified steps	29	51.8	verified steps	27	52.8	falsified 16 steps	343.0	falsified 17 steps	597.4
Mastercard_DDA_OnlinePIN_High	verified steps	29	56.1	verified steps	28	58.6	verified 4865 steps	1027.6	verified 6371 steps	1499.7
Mastercard_DDA_OnlinePIN_Low	verified steps	29	53.2	verified steps	27	57.3	falsified 16 steps	346.5	falsified 17 steps	605.5
Mastercard_SDA_NoPIN_High	falsified steps	45	42.1	falsified steps	46	45.0	×	-	×	-
Mastercard_SDA_NoPIN_Low	verified steps	27	51.9	verified steps	25	53.0	falsified 13 steps	188.2	falsified 14 steps	51.8
Mastercard_SDA_OnlinePIN_High	×		53.0	verified steps	26	54.0	verified 2315 steps	505.1	verified 3047 steps	722.2
Mastercard_SDA_OnlinePIN_Low	verified steps	27	49.1	verified steps	25	53.6	falsified 13 steps	195.7	falsified 14 steps	49.8
Visa_DDA_High	verified steps	29	52.1	verified steps	29	58.8	verified 5617 steps	932.4	verified 5657 steps	993.6
Visa_DDA_Low	verified steps	28	52.9	verified steps	28	59.4	falsified 17 steps	1300.4	falsified 18 steps	882.3
Visa_DDA_Low_Fix	verified steps	28	65.6	verified steps	28	69.7	verified 3710 steps	735.2	verified 3728 steps	786.6
Visa_EMV_High	verified steps	22	48.0	verified steps	23	54.0	verified 308 steps	68.3	verified 356 steps	72.9
Visa_EMV_Low	verified steps	22	47.2	verified steps	23	52.9	verified 210 steps	57.8	verified 242 steps	66.6

	auth_to_terminal_minimal				auth_to_terminal			
Mastercard_CDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_CDA_NoPIN_Low	×	3602.5	×	3602.2	×	3601.2	×	3600.6
Mastercard_CDA_OnlinePIN_High	×	3602.4	×	3602.2	×	3600.6	×	3600.8
Mastercard_CDA_OnlinePIN_Low	×	3602.3	×	3601.9	×	3601.2	×	3600.6
Mastercard_DDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_DDA_NoPIN_Low	×	3602.8	falsified steps	13 240.2	×	-	×	-
Mastercard_DDA_OnlinePIN_High	×	3602.9	×	3602.8	×	3601.3	×	3601.6
Mastercard_DDA_OnlinePIN_Low	×	3602.8	falsified steps	13 252.0	×	-	×	-
Mastercard_SDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_SDA_NoPIN_Low	×	3602.8	falsified steps	10 545.6	×	-	×	-
Mastercard_SDA_OnlinePIN_High	×	3602.8	×	3603.0	×	3602.6	×	3602.7
Mastercard_SDA_OnlinePIN_Low	×	3602.9	falsified steps	10 542.3	×	-	×	-
Visa_DDA_High	×	3602.8	×	3602.7	×	3602.6	×	3602.6
Visa_DDA_Low	×	3603.1	falsified steps	14 943.5	×	-	×	-
Visa_DDA_Low_Fix	×	3602.8	×	3602.9	×	3602.9	×	3602.8
Visa_EMV_High	falsified steps	11 77.8	falsified steps	11 85.4	×	-	×	-
Visa_EMV_Low	falsified steps	11 76.0	falsified steps	11 80.3	×	-	×	-

	auth_to_bank_minimal				auth_to_bank			
Mastercard_CDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_CDA_NoPIN_Low	verified 141 steps	64.0	verified 147 steps	67.8	verified 2818 steps	623.2	verified 612 steps	173.5
Mastercard_CDA_OnlinePIN_High	verified 221 steps	75.6	verified 260 steps	84.8	verified 3566 steps	809.3	verified 1086 steps	295.4
Mastercard_CDA_OnlinePIN_Low	verified 141 steps	63.2	verified 147 steps	64.8	verified 2818 steps	608.3	verified 612 steps	167.4
Mastercard_DDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_DDA_NoPIN_Low	verified 137 steps	60.7	verified 143 steps	63.9	verified 2912 steps	491.5	verified 666 steps	159.2
Mastercard_DDA_OnlinePIN_High	verified 203 steps	69.8	verified 242 steps	77.5	verified 3372 steps	632.5	verified 1116 steps	265.5
Mastercard_DDA_OnlinePIN_Low	verified 137 steps	60.2	verified 143 steps	67.1	verified 2912 steps	495.2	verified 666 steps	155.1
Mastercard_SDA_NoPIN_High	×	-	×	-	×	-	×	-
Mastercard_SDA_NoPIN_Low	verified 102 steps	57.1	verified 108 steps	62.5	verified 1377 steps	283.5	verified 363 steps	103.3
Mastercard_SDA_OnlinePIN_High	verified 150 steps	62.6	verified 183 steps	69.9	verified 1688 steps	354.2	verified 585 steps	153.4
Mastercard_SDA_OnlinePIN_Low	verified 102 steps	55.0	verified 108 steps	60.1	verified 1377 steps	283.0	verified 363 steps	98.6
Visa_DDA_High	verified 205 steps	70.2	verified 205 steps	73.9	verified 953 steps	166.9	verified 953 steps	182.5
Visa_DDA_Low	verified 337 steps	84.9	verified 337 steps	87.6	verified 1922 steps	305.7	verified 1922 steps	337.2
Visa_DDA_Low_Fix	verified 310 steps	94.0	verified 310 steps	101.5	verified 1382 steps	283.9	verified 1382 steps	309.2
Visa_EMV_High	falsified 11 steps	54.1	falsified 11 steps	60.0	×	-	×	-
Visa_EMV_Low	falsified 11 steps	61.3	falsified 11 steps	66.2	×	-	×	-

	secrecy_MK					secrecy_privkCard						
Mastercard_CDA_NoPIN_High	verified steps	12	47.2	verified steps	12	46.6	verified steps	13	44.8	verified steps	14	51.4
Mastercard_CDA_NoPIN_Low	verified steps	12	44.1	verified steps	12	49.8	verified steps	13	44.5	verified steps	14	47.6
Mastercard_CDA_OnlinePIN_High	verified steps	12	45.4	verified steps	12	49.5	verified steps	13	47.9	verified steps	14	50.5
Mastercard_CDA_OnlinePIN_Low	verified steps	12	48.1	verified steps	12	51.5	verified steps	13	47.5	verified steps	14	46.1
Mastercard_DDA_NoPIN_High	verified steps	12	47.1	verified steps	12	49.8	verified steps	13	45.0	verified steps	14	49.1
Mastercard_DDA_NoPIN_Low	verified steps	12	43.9	verified steps	12	51.2	verified steps	13	46.2	verified steps	14	50.2
Mastercard_DDA_OnlinePIN_High	verified steps	12	47.7	verified steps	12	47.2	verified steps	13	48.3	verified steps	14	46.9
Mastercard_DDA_OnlinePIN_Low	verified steps	12	43.9	verified steps	12	50.5	verified steps	13	47.4	verified steps	14	48.7
Mastercard_SDA_NoPIN_High	verified steps	12	47.3	verified steps	12	47.8	×	-	×	×	-	-
Mastercard_SDA_NoPIN_Low	verified steps	12	44.6	verified steps	12	48.8	×	-	×	×	-	-
Mastercard_SDA_OnlinePIN_High	verified steps	12	47.5	verified steps	12	52.5	×	-	×	×	-	-
Mastercard_SDA_OnlinePIN_Low	verified steps	12	44.1	verified steps	12	48.5	×	-	×	×	-	-
Visa_DDA_High	verified steps	12	46.3	verified steps	12	49.3	verified steps	13	44.7	verified steps	14	50.6
Visa_DDA_Low	verified steps	12	43.7	verified steps	12	50.4	verified steps	13	46.4	verified steps	14	48.3
Visa_DDA_Low_Fix	verified steps	12	58.6	verified steps	12	63.2	verified steps	13	54.3	verified steps	14	61.6
Visa_EMV_High	verified steps	12	44.1	verified steps	12	48.8	verified steps	13	44.2	verified steps	14	46.2
Visa_EMV_Low	verified steps	12	43.3	verified steps	12	46.4	verified steps	13	47.6	verified steps	14	50.6

	secrecy_PIN				secrecy_PAN							
Mastercard_CDA_NoPIN_High	×	-	×	-	falsified steps	7	43.6	falsified steps	7	44.9		
Mastercard_CDA_NoPIN_Low	×	-	×	-	falsified steps	7	45.4	falsified steps	7	46.9		
Mastercard_CDA_OnlinePIN_High	verified steps	4	46.1	verified steps	4	46.3	falsified steps	7	43.4	falsified steps	7	45.0
Mastercard_CDA_OnlinePIN_Low	verified steps	4	46.8	verified steps	4	45.5	falsified steps	7	45.4	falsified steps	7	47.7
Mastercard_DDA_NoPIN_High	×	-	×	-	falsified steps	7	46.0	falsified steps	7	48.5		
Mastercard_DDA_NoPIN_Low	×	-	×	-	falsified steps	7	45.2	falsified steps	7	46.1		
Mastercard_DDA_OnlinePIN_High	verified steps	4	47.1	verified steps	4	46.8	falsified steps	7	45.2	falsified steps	7	49.4
Mastercard_DDA_OnlinePIN_Low	verified steps	4	48.1	verified steps	4	46.8	falsified steps	7	45.8	falsified steps	7	50.0
Mastercard_SDA_NoPIN_High	×	-	×	-	falsified steps	7	41.1	falsified steps	7	49.9		
Mastercard_SDA_NoPIN_Low	×	-	×	-	falsified steps	7	47.7	falsified steps	7	46.1		
Mastercard_SDA_OnlinePIN_High	verified steps	4	45.2	verified steps	4	46.0	falsified steps	7	43.9	falsified steps	7	45.8
Mastercard_SDA_OnlinePIN_Low	verified steps	4	46.1	verified steps	4	47.4	falsified steps	7	46.7	falsified steps	7	46.8
Visa_DDA_High	verified steps	4	44.8	verified steps	4	50.7	falsified steps	7	43.7	falsified steps	7	47.6
Visa_DDA_Low	verified steps	4	45.5	verified steps	4	49.2	falsified steps	7	46.6	falsified steps	7	48.8
Visa_DDA_Low_Fix	verified steps	4	59.9	verified steps	4	60.5	falsified steps	7	58.7	falsified steps	7	59.1
Visa_EMV_High	verified steps	4	50.3	verified steps	4	47.1	falsified steps	7	47.2	falsified steps	7	46.4
Visa_EMV_Low	verified steps	4	44.2	verified steps	4	48.3	falsified steps	7	43.7	falsified steps	7	46.7