FIG. 1A

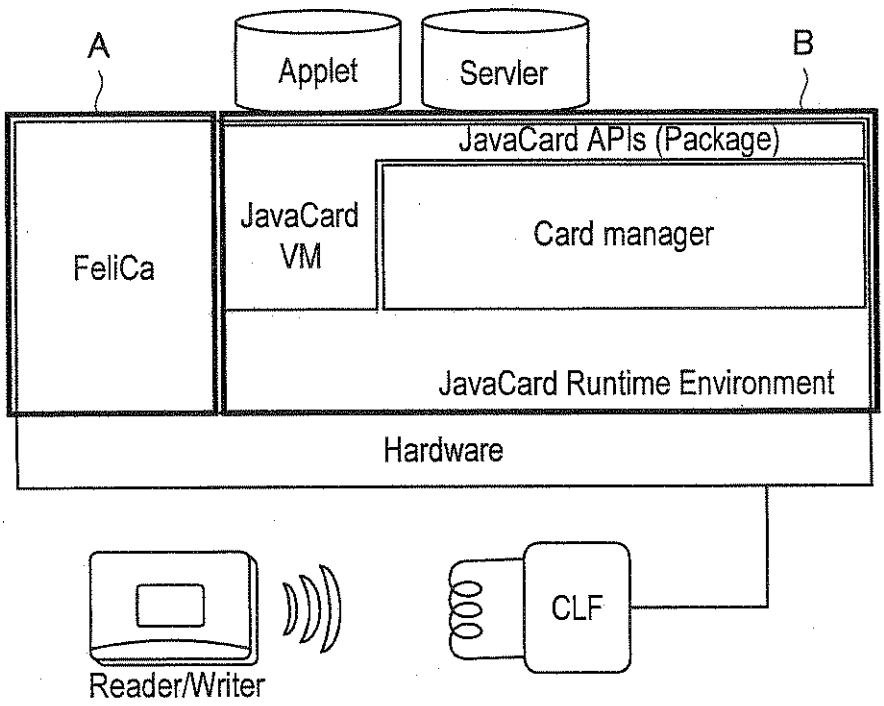

A
Applet
Servler
B
JavaCard APIs (Package)
FeliCa
JavaCard VM
Card manager
JavaCard Runtime Environment
Hardware
CLF
Reader/Writer

FIG. 1B

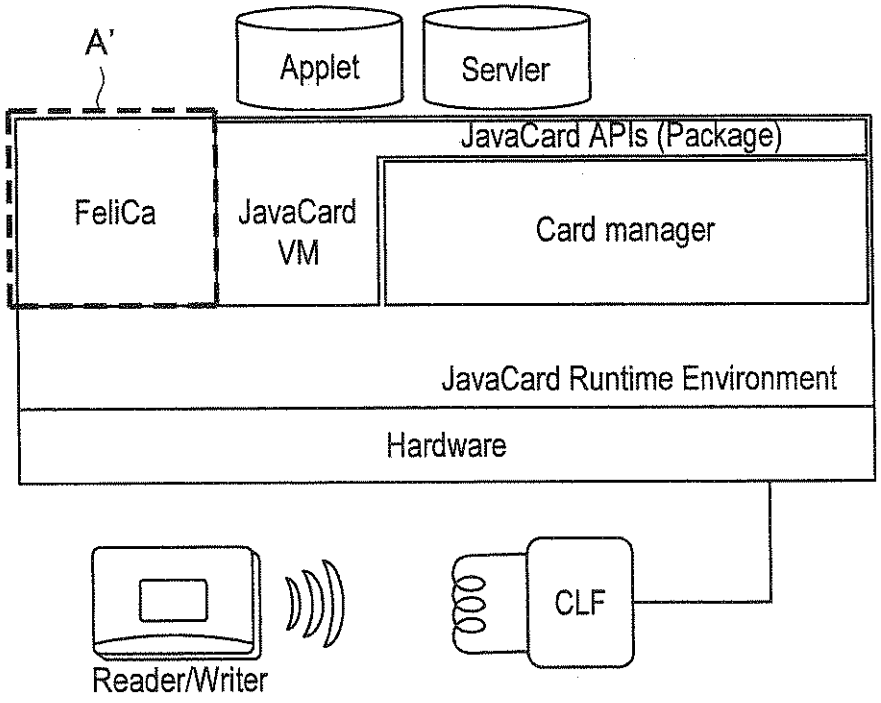

A'
Applet
Servler
JavaCard APIs (Package)
FeliCa
JavaCard VM
Card manager
JavaCard Runtime Environment
Hardware
CLF
Reader/Writer

FIG. 2

A

	SC	AID	IDm	PMm	MF
1					
2					
3					
4					

B

	SC	AID	IDm	PMm	MF
1	0003	1111	5678	89AB	True
2					
3					
4					

REGISTER VALUE IN TABLE

Deactivate → Activate

Type F AP1

	SC	AID	IDm	PMm	MF
1	0003	1111	5678	89AB	True

C

	SC	AID	IDm	PMm	MF
1	0003	1111	5678	89AB	True
2	FE00	2222	0102	FFFF	True
3	12FE	3333	01FE	FFFF	True
4					

REGISTER VALUE IN TABLE

Deactivate → Activate

Type F AP2

	SC	AID	IDm	PMm	MF
1	FE00	2222	0102	FFFF	True
2	12FE	3333	01FE	FFFF	True

D

	SC	AID	IDm	PMm	MF
1	0003	1111	5678	89AB	True
2	FE00	2222	0102	FFFF	True
3	12FE	3333	01FE	FFFF	True
4					

conflict

Deactivate → Deactivate (UNCHANGEABLE)

Type F AP3

	SC	AID	IDm	PMm	MF
1	FE00	4444	1234	1234	True

FIG. 3

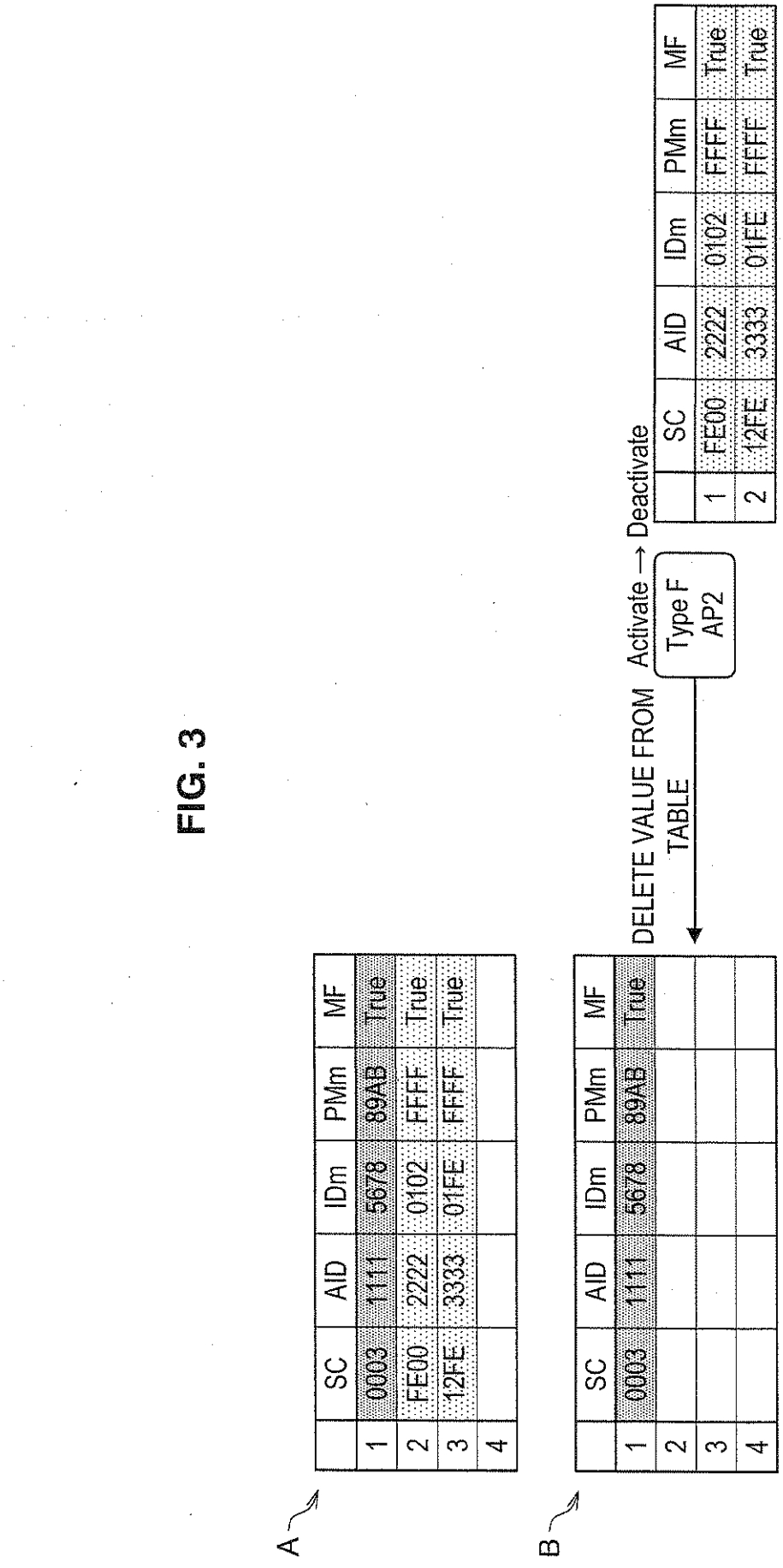

A
B
DELETE VALUE FROM TABLE
Activate → Deactivate
Type F AP2
SC
AID
IDm
PMm
MF
1 0003 1111 5678 89AB True
2 FE00 2222 0102 FFFF True
3 12FE 3333 01FE FFFF True
4
1 FE00 2222 0102 FFFF True
2 12FE 3333 01FE FFFF True

FIG. 4

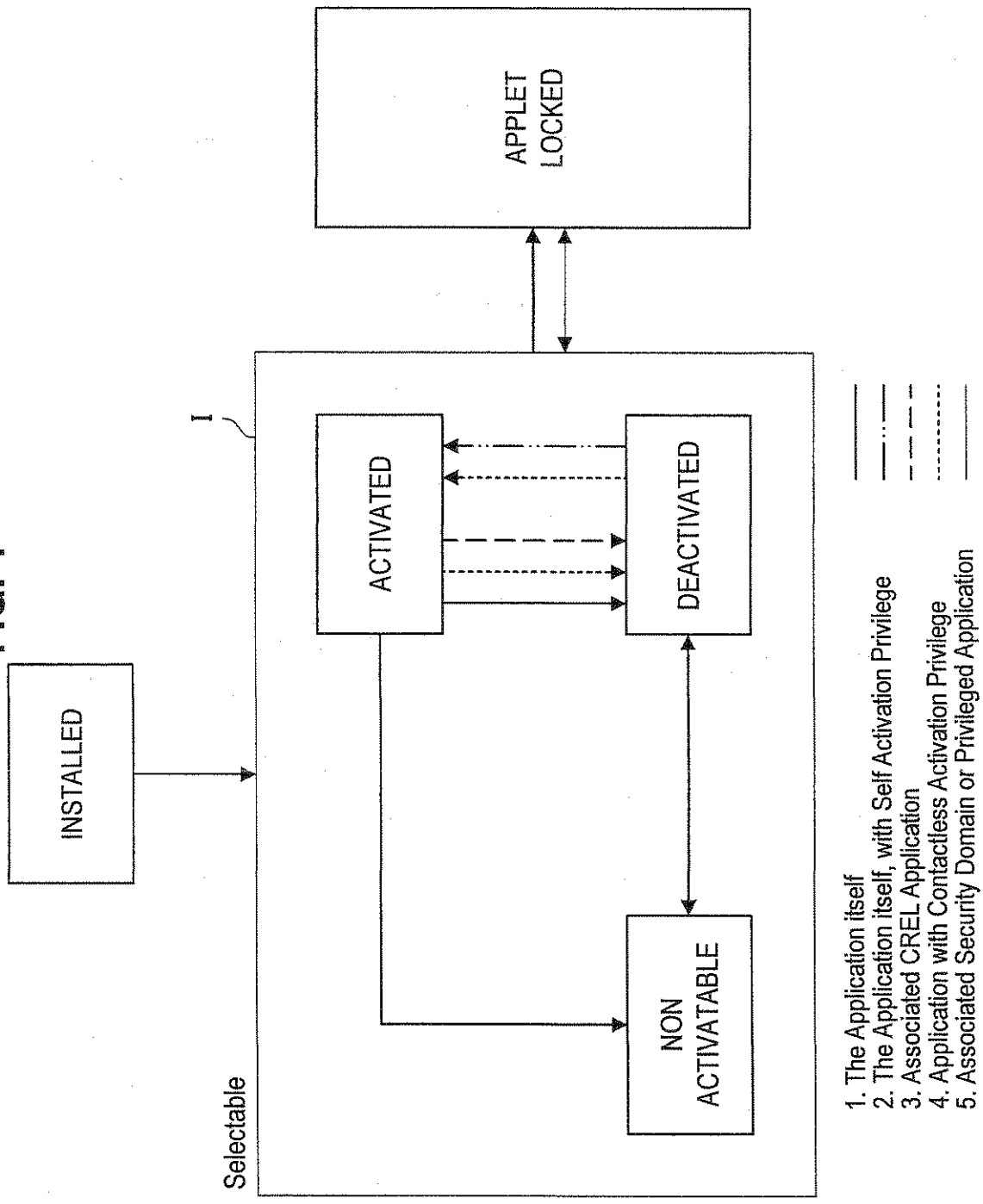

INSTALLED
Selectable
1
ACTIVATED
DEACTIVATED
NON ACTIVATABLE
APPLET LOCKED
1. The Application itself
2. The Application itself, with Self Activation Privilege
3. Associated CREL Application
4. Application with Contactless Activation Privilege
5. Associated Security Domain or Privileged Application

FIG. 5

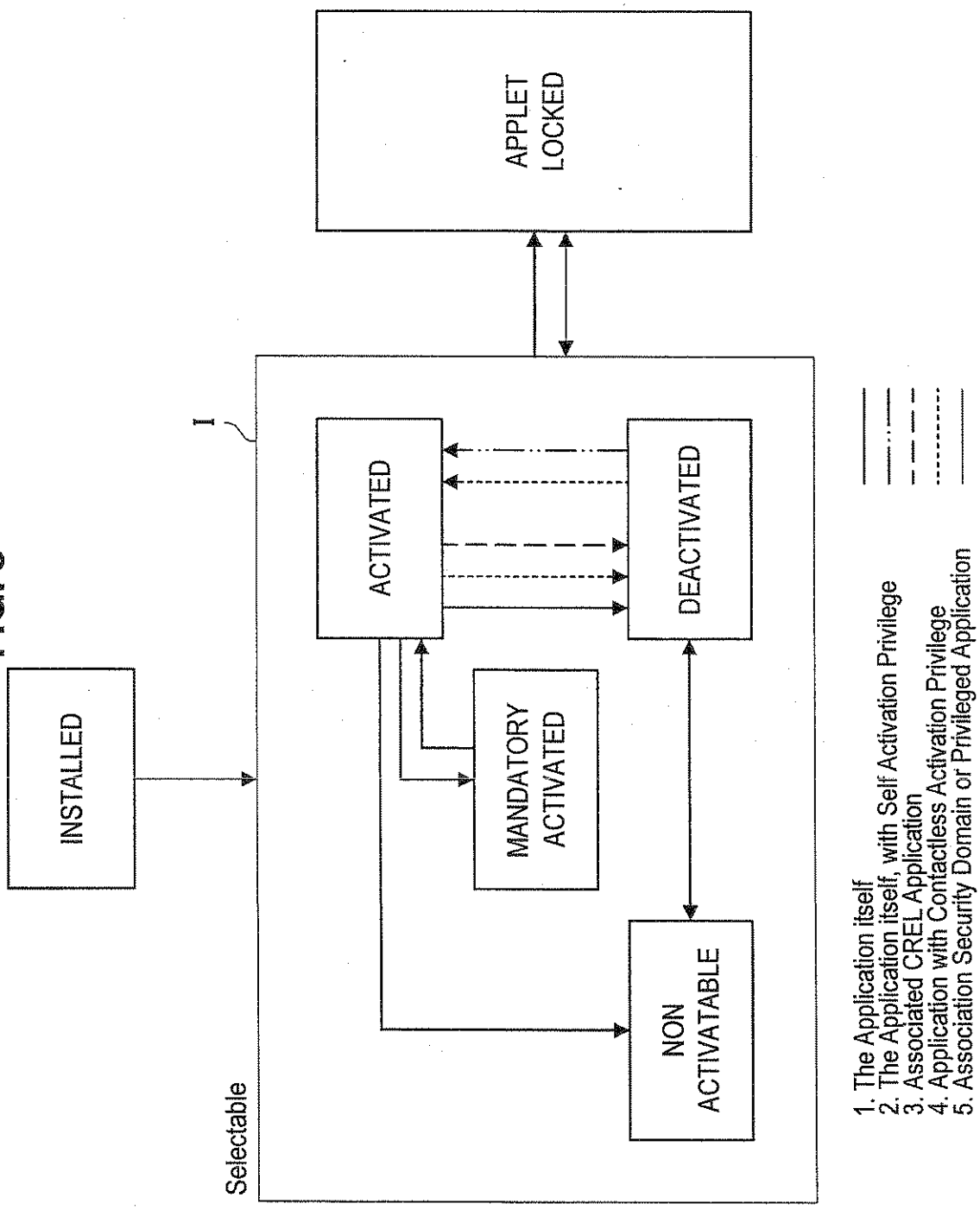

APPLET LOCKED
INSTALLED
ACTIVATED
DEACTIVATED
MANDATORY ACTIVATED
NON ACTIVATABLE
Selectable
1
1. The Application itself
2. The Application itself, with Self Activation Privilege
3. Associated CREL Application
4. Application with Contactless Activation Privilege
5. Association Security Domain or Privileged Application

FIG. 6

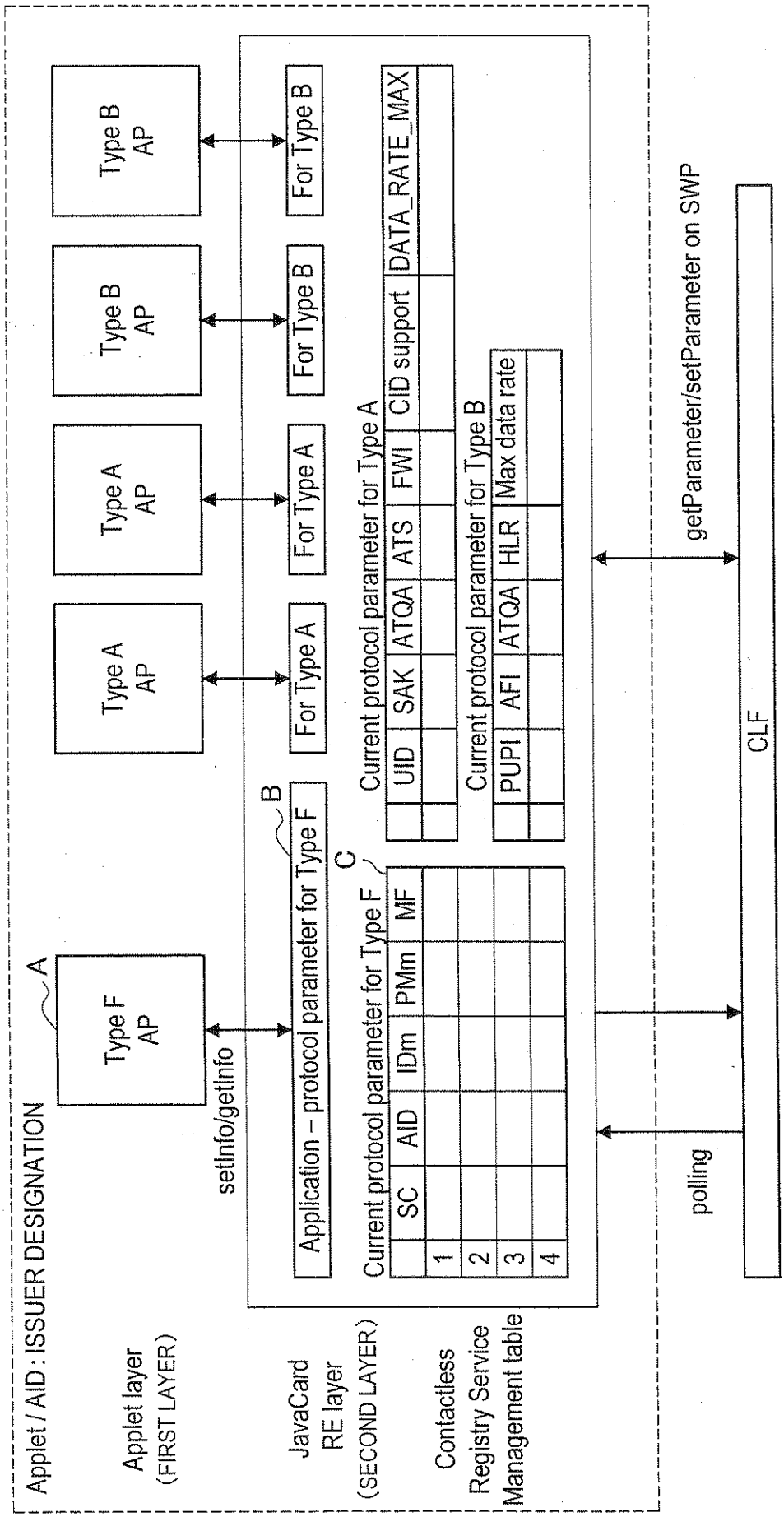

Applet / AID : ISSUER DESIGNATION
Applet layer
(FIRST LAYER)
JavaCard
RE layer
(SECOND LAYER)
Contactless
Registry Service
Management table
A
Type F AP
Type A AP
Type A AP
Type B AP
Type B AP
setInfo/getInfo
B
Application – protocol parameter for Type F
For Type A
For Type A
For Type B
For Type B
C
Current protocol parameter for Type F
SC
AID
IDm
PMm
MF
1
2
3
4
Current protocol parameter for Type A
UID
SAK
ATQA
ATS
FWI
CID support
DATA_RATE_MAX
Current protocol parameter for Type B
PUPI
AFI
ATQA
HLR
Max data rate
polling
getParameter/setParameter on SWP
CLF

FIG. 7

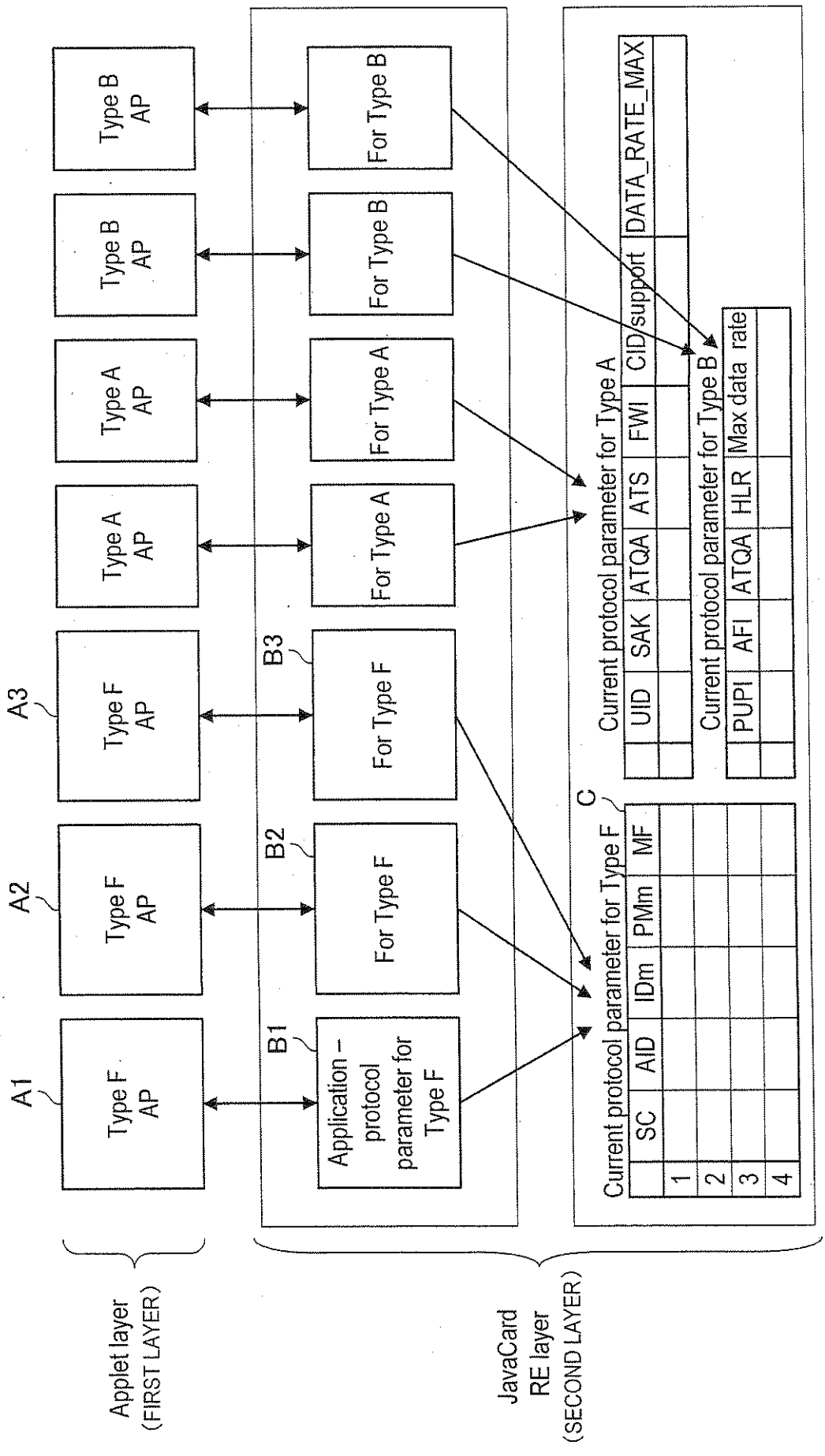

Applet layer (FIRST LAYER)
JavaCard RE layer (SECOND LAYER)
A1
A2
A3
B1
B2
B3
C
Type F AP
Type F AP
Type F AP
Type A AP
Type A AP
Type B AP
Type B AP
Application – protocol parameter for Type F
For Type F
For Type F
For Type A
For Type A
For Type B
For Type B
Current protocol parameter for Type F
SC
AID
IDm
PMm
MF
1
2
3
4
Current protocol parameter for Type A
UID
SAK
ATQA
ATS
FWI
CID support
DATA_RATE_MAX
Current protocol parameter for Type B
PUPI
AFI
ATQA
HLR
Max data rate

FIG. 8

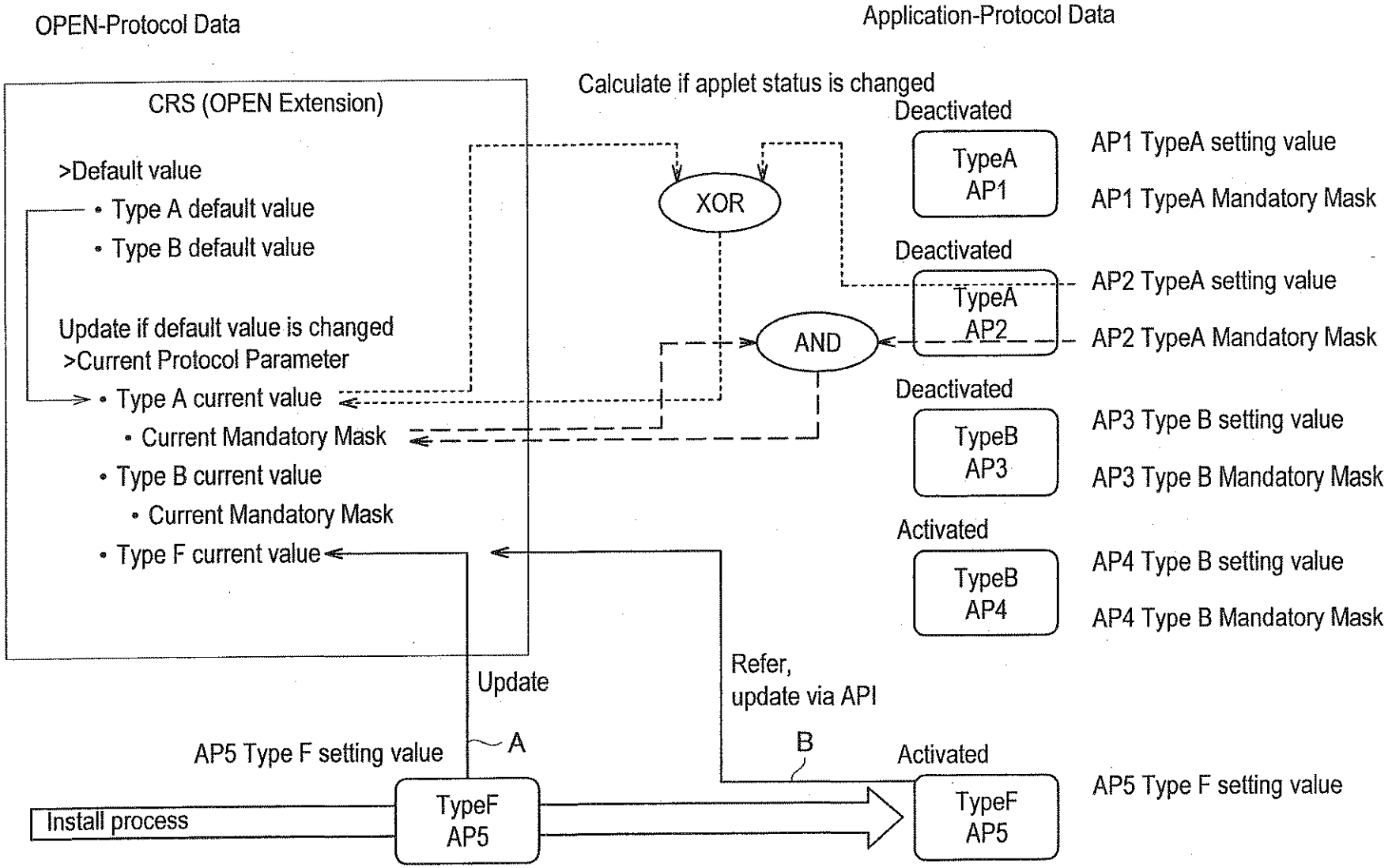

OPEN-Protocol Data
Application-Protocol Data
CRS (OPEN Extension)
>Default value
• Type A default value
• Type B default value
Update if default value is changed
>Current Protocol Parameter
• Type A current value
• Current Mandatory Mask
• Type B current value
• Current Mandatory Mask
• Type F current value
Calculate if applet status is changed
XOR
AND
Deactivated
TypeA AP1
AP1 TypeA setting value
AP1 TypeA Mandatory Mask
Deactivated
TypeA AP2
AP2 TypeA setting value
AP2 TypeA Mandatory Mask
Deactivated
TypeB AP3
AP3 Type B setting value
AP3 Type B Mandatory Mask
Activated
TypeB AP4
AP4 Type B setting value
AP4 Type B Mandatory Mask
Update
Refer, update via API
AP5 Type F setting value
A
B
Activated
Install process
TypeF AP5
TypeF AP5
AP5 Type F setting value

FIG. 9

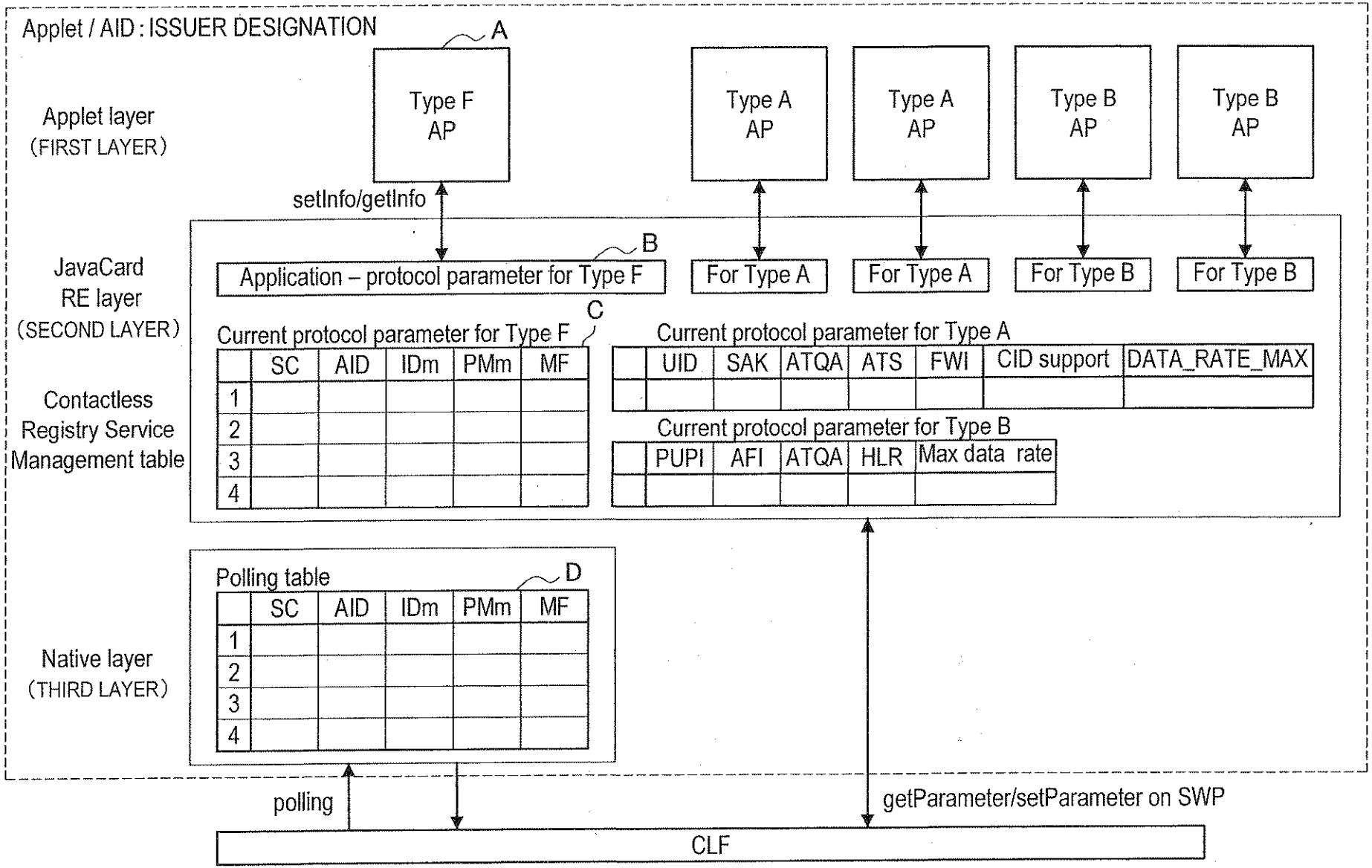

Applet / AID : ISSUER DESIGNATION
A
Applet layer
(FIRST LAYER)
Type F AP
Type A AP
Type A AP
Type B AP
Type B AP
setInfo/getInfo
JavaCard
RE layer
(SECOND LAYER)
B
Application – protocol parameter for Type F
For Type A
For Type A
For Type B
For Type B
C
Current protocol parameter for Type F
SC AID IDm PMm MF
1
2
3
4
Current protocol parameter for Type A
UID SAK ATQA ATS FWI CID support DATA_RATE_MAX
Current protocol parameter for Type B
PUPI AFI ATQA HLR Max data rate
Contactless
Registry Service
Management table
Polling table
D
SC AID IDm PMm MF
1
2
3
4
Native layer
(THIRD LAYER)
polling
getParameter/setParameter on SWP
CLF

FIG. 10

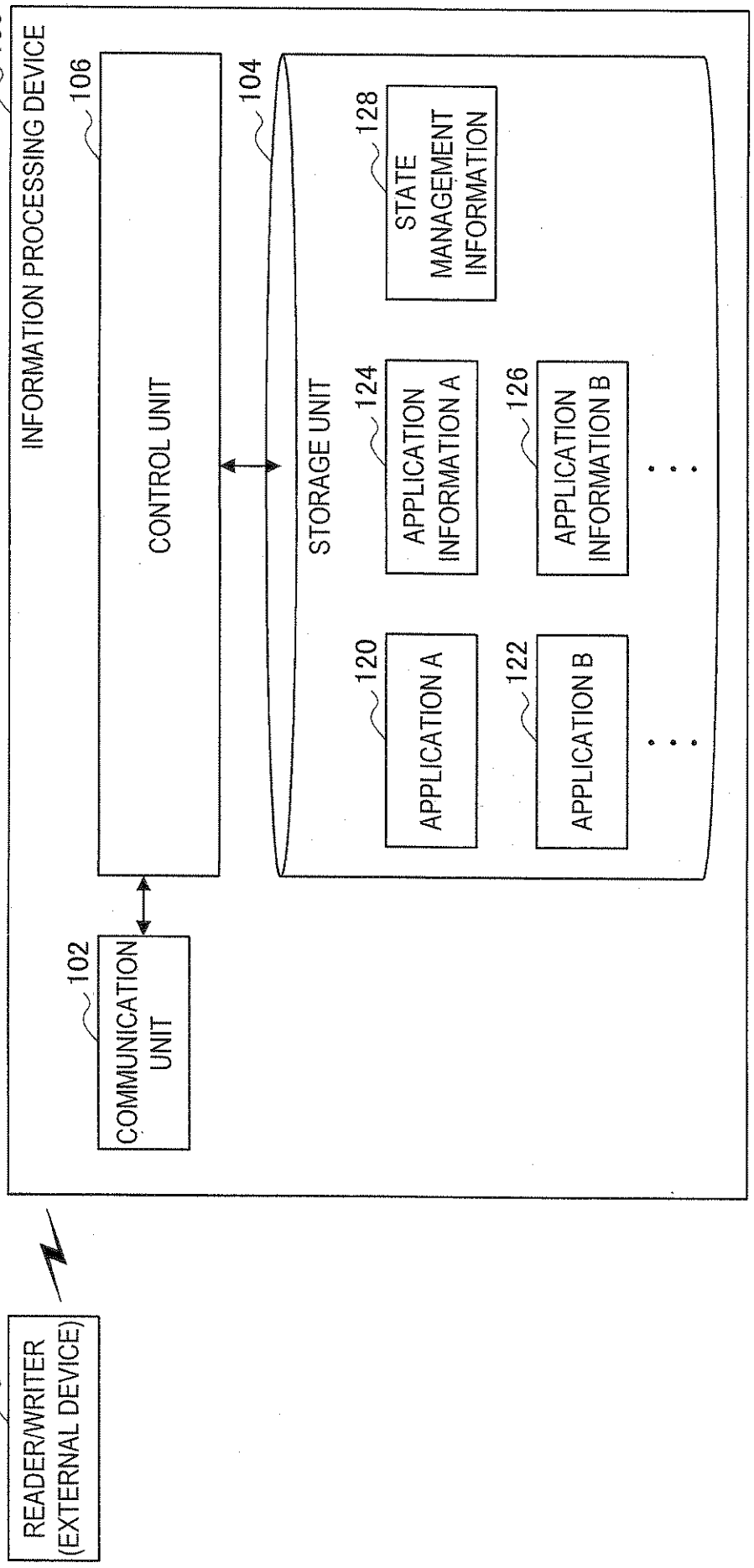

100
INFORMATION PROCESSING DEVICE
106
CONTROL UNIT
104
STORAGE UNIT
128
STATE MANAGEMENT INFORMATION
124
APPLICATION INFORMATION A
126
APPLICATION INFORMATION B
120
APPLICATION A
122
APPLICATION B
102
COMMUNICATION UNIT
200
READER/WRITER (EXTERNAL DEVICE)

FIG. 11

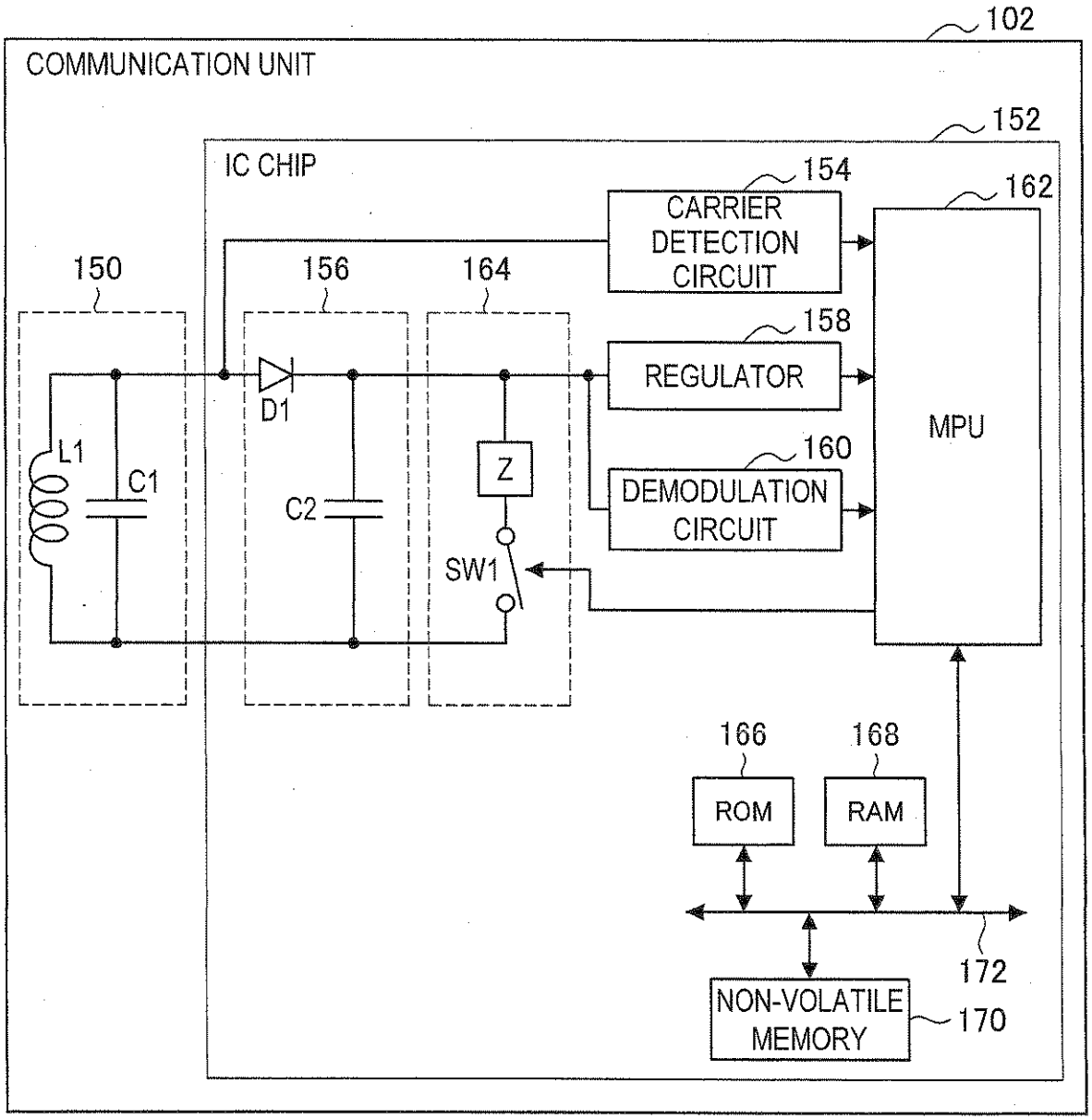

102
COMMUNICATION UNIT
152
IC CHIP
154
CARRIER DETECTION CIRCUIT
162
150
156
164
158
REGULATOR
MPU
D1
L1
C1
C2
Z
160
DEMODULATION CIRCUIT
SW1
166
168
ROM
RAM
172
NON-VOLATILE MEMORY
170

FIG. 12

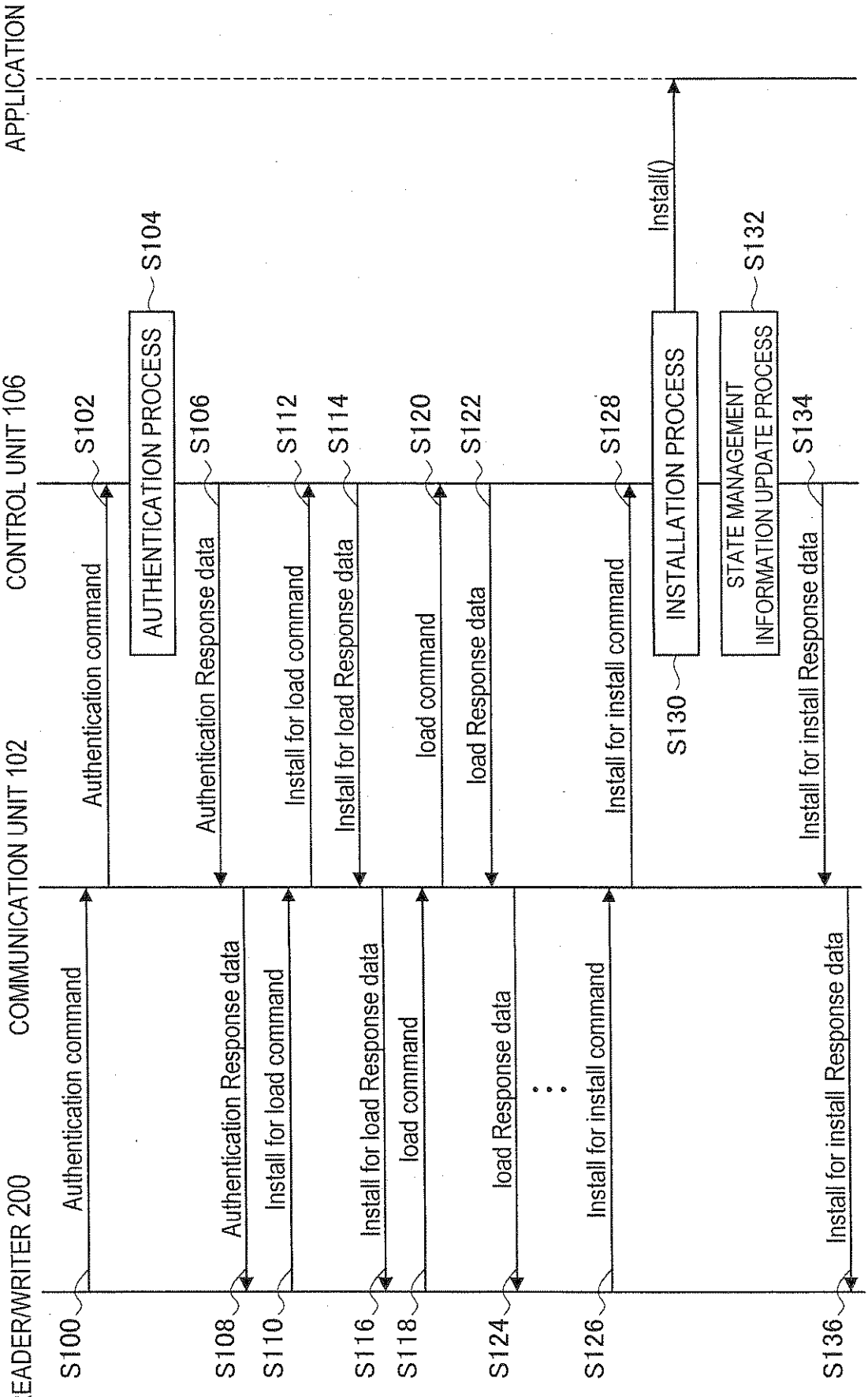

READER/WRITER 200
COMMUNICATION UNIT 102
CONTROL UNIT 106
APPLICATION
S100
Authentication command
S102
Authentication command
AUTHENTICATION PROCESS
S104
S106
Authentication Response data
S108
Authentication Response data
S110
Install for load command
S112
Install for load command
S114
Install for load Response data
S116
Install for load Response data
S118
load command
S120
load command
S122
load Response data
S124
load Response data
S126
Install for install command
S128
Install for install command
INSTALLATION PROCESS
S130
Install()
STATE MANAGEMENT
INFORMATION UPDATE PROCESS
S132
Install for install Response data
S134
Install for install Response data
S136

FIG. 13

A

Tag	Len	Value Description				
'A0'	'23'	Protocol Parameter Data				
		Tag	Len	Value Description		
		'80'	'18'	The 1st System specific parameters		
				Tag	Len	Value
				'90'	'02'	'0001'
				'91'	'08'	'02FE000000000000'
				'92'	'08'	'FFFFFFFFFFFFFFFF'
				'93'	'01'	'00'
		'81'	'00'	The 2nd System		
		'82'	'00'	The 3rd System		
		'83'	'00'	The 4th System		

B

Sc	PID(IDm)	RTD(PMm)	MF	AID
0001	02FE000000000000	FFFFFFFFFFFFFFFF	00: TRUE	AID-A

FIG. 14

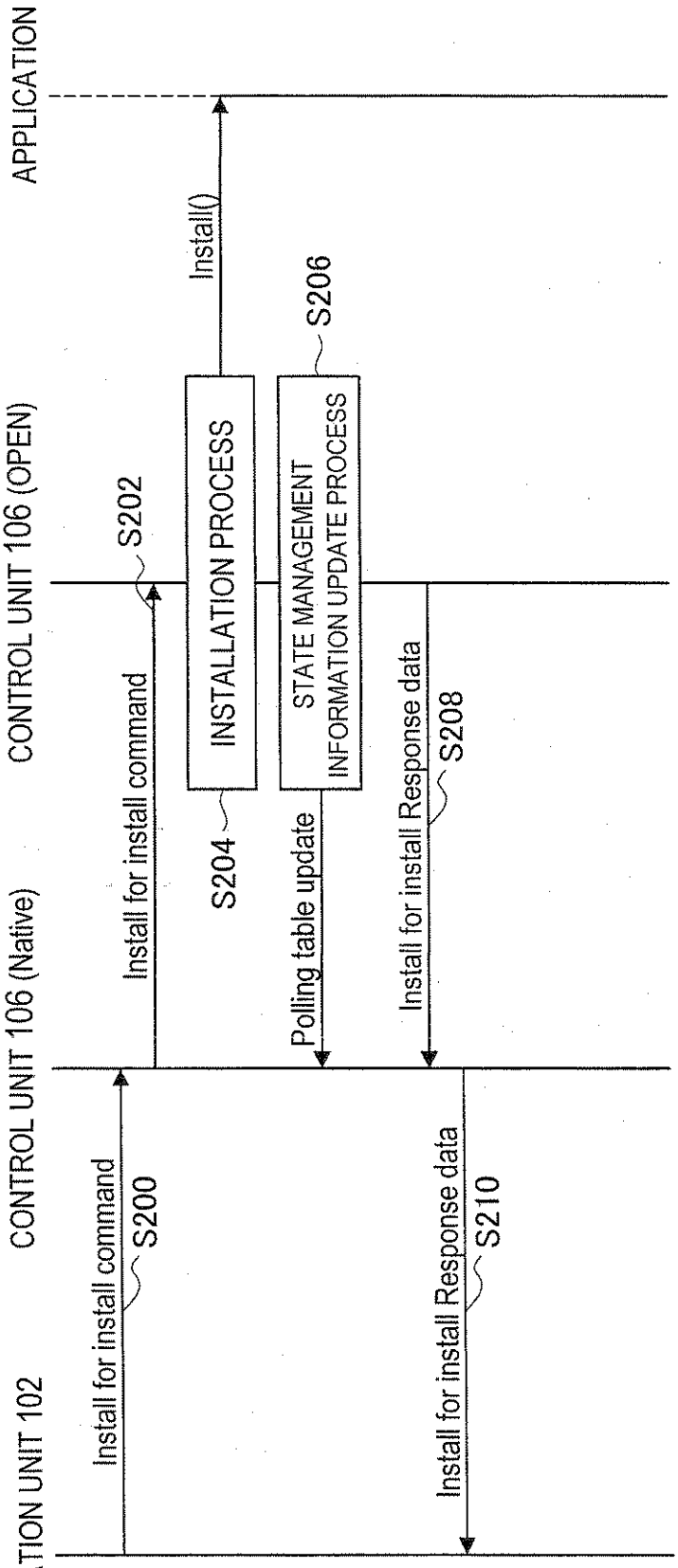

COMMUNICATION UNIT 102
CONTROL UNIT 106 (Native)
CONTROL UNIT 106 (OPEN)
APPLICATION
Install for install command
S200
Install for install command
S202
INSTALLATION PROCESS
S204
Install()
STATE MANAGEMENT INFORMATION UPDATE PROCESS
S206
Polling table update
Install for install Response data
S208
Install for install Response data
S210

FIG. 15

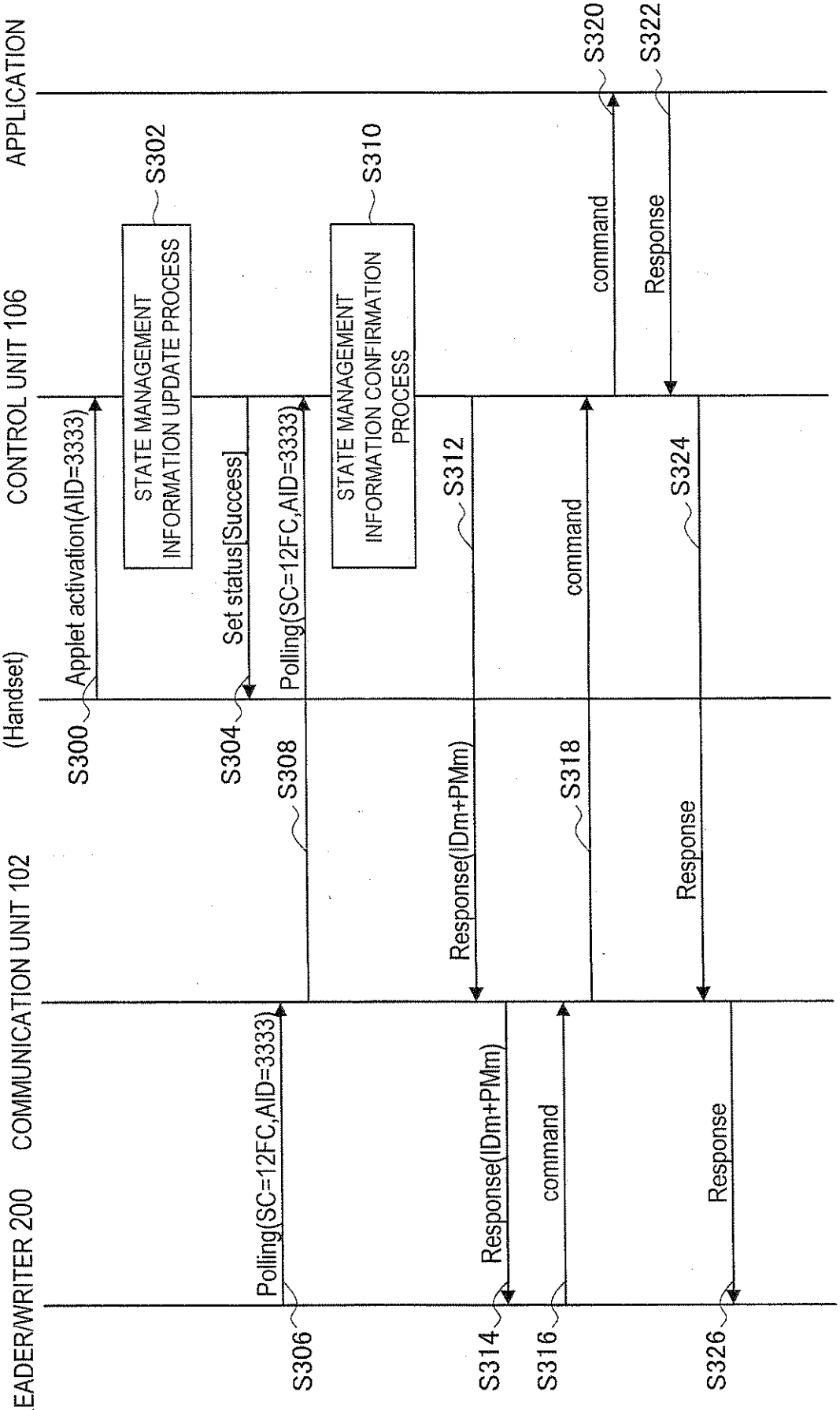

READER/WRITER 200
COMMUNICATION UNIT 102
Base band chip (Handset)
CONTROL UNIT 106
APPLICATION
S300
Applet activation(AID=3333)
S302
STATE MANAGEMENT INFORMATION UPDATE PROCESS
S304
Set status[Success]
S306
Polling(SC=12FC,AID=3333)
S308
Polling(SC=12FC,AID=3333)
S310
STATE MANAGEMENT INFORMATION CONFIRMATION PROCESS
S312
Response(IDm+PMm)
S314
Response(IDm+PMm)
S316
command
S318
command
S320
command
S322
Response
S324
Response
S326
Response

FIG. 16

A

	SC	AID	IDm	PMm	MF
1	0003	1111	11	FF	T
2	FE00	2222	22	FF	T
3					
4					

B

	SC	AID	IDm	PMm	MF
1	0003	1111	11	FF	T
2	FE00	2222	22	FF	T
3	12FC	3333	33	FF	F
4					

FIG. 17

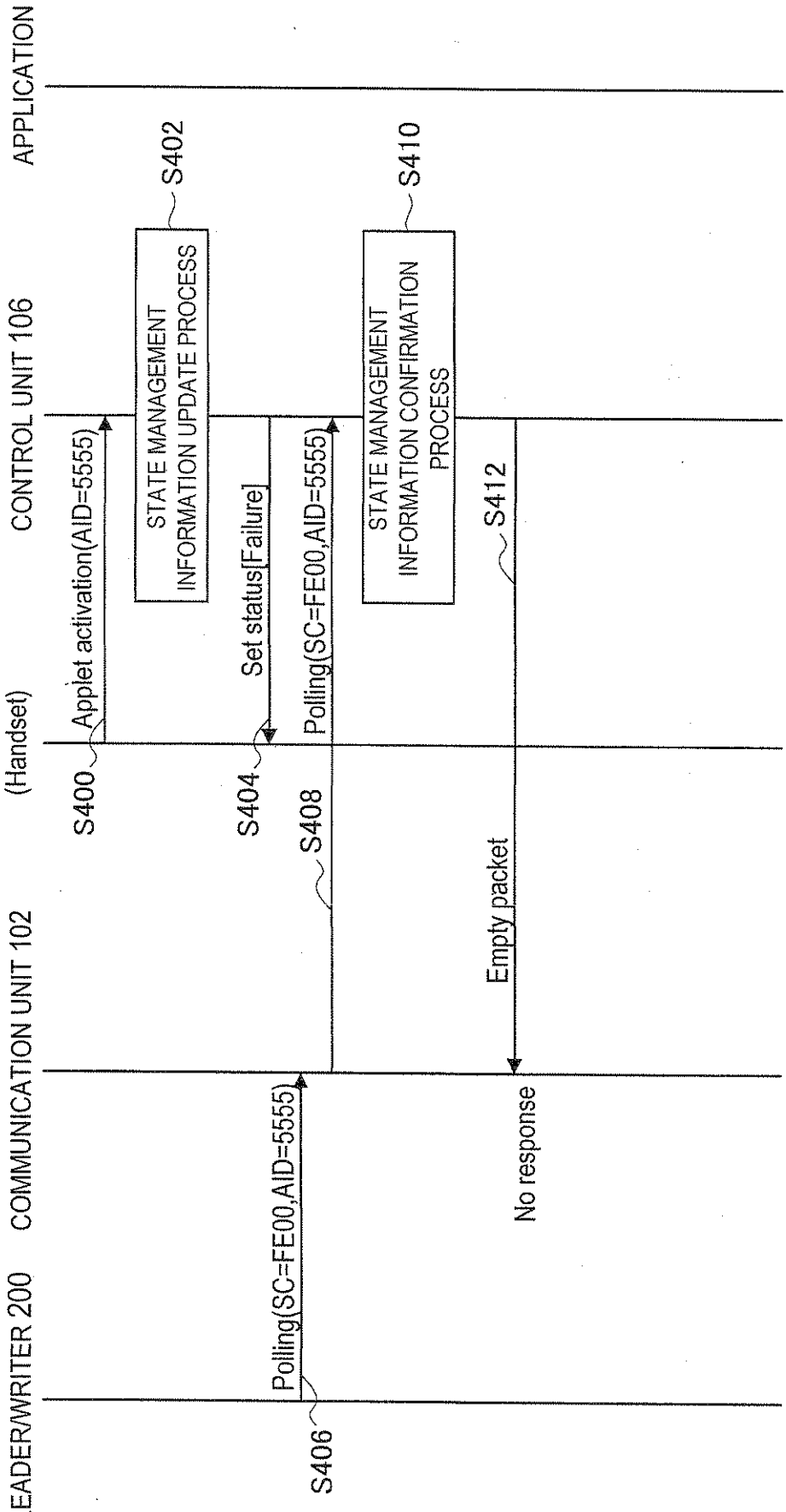

READER/WRITER 200
COMMUNICATION UNIT 102
Base band chip (Handset)
CONTROL UNIT 106
APPLICATION
S400
Applet activation(AID=5555)
S402
STATE MANAGEMENT INFORMATION UPDATE PROCESS
S404
Set status[Failure]
S406
Polling(SC=FE00,AID=5555)
S408
Polling(SC=FE00,AID=5555)
S410
STATE MANAGEMENT INFORMATION CONFIRMATION PROCESS
S412
Empty packet
No response

FIG. 18

	SC	AID	IDm	PMm	MF
1	0003	1111	11	FF	T
2	FE00	2222	22	FF	T
3	12FC	3333	33	FF	F
4	FFEE	4444	44	FF	F

FIG. 19

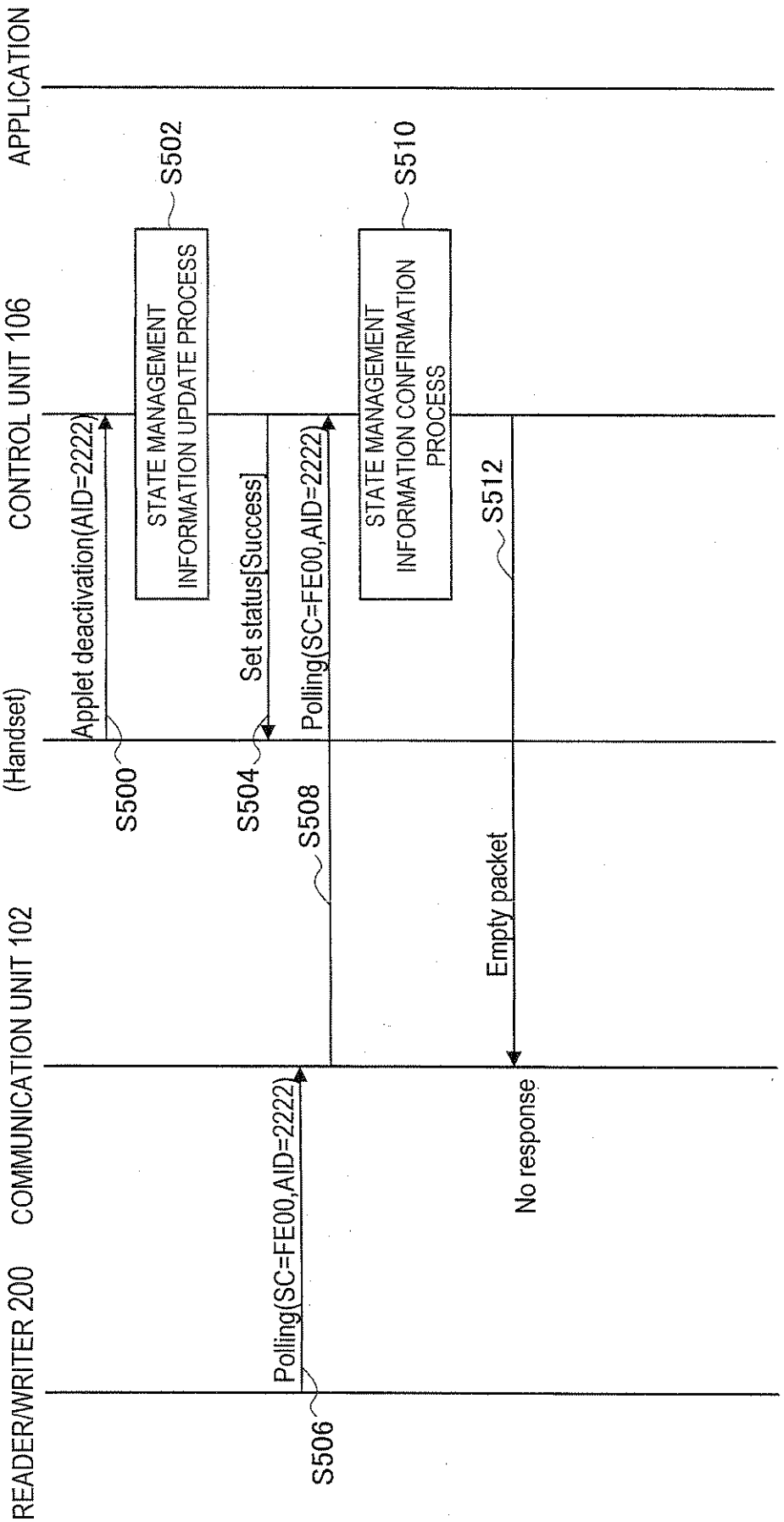

READER/WRITER 200
COMMUNICATION UNIT 102
Base band chip (Handset)
CONTROL UNIT 106
APPLICATION
Applet deactivation(AID=2222)
S500
STATE MANAGEMENT INFORMATION UPDATE PROCESS
S502
Set status[Success]
S504
Polling(SC=FE00,AID=2222)
S506
S508
STATE MANAGEMENT INFORMATION CONFIRMATION PROCESS
S510
S512
Empty packet
No response

FIG. 20

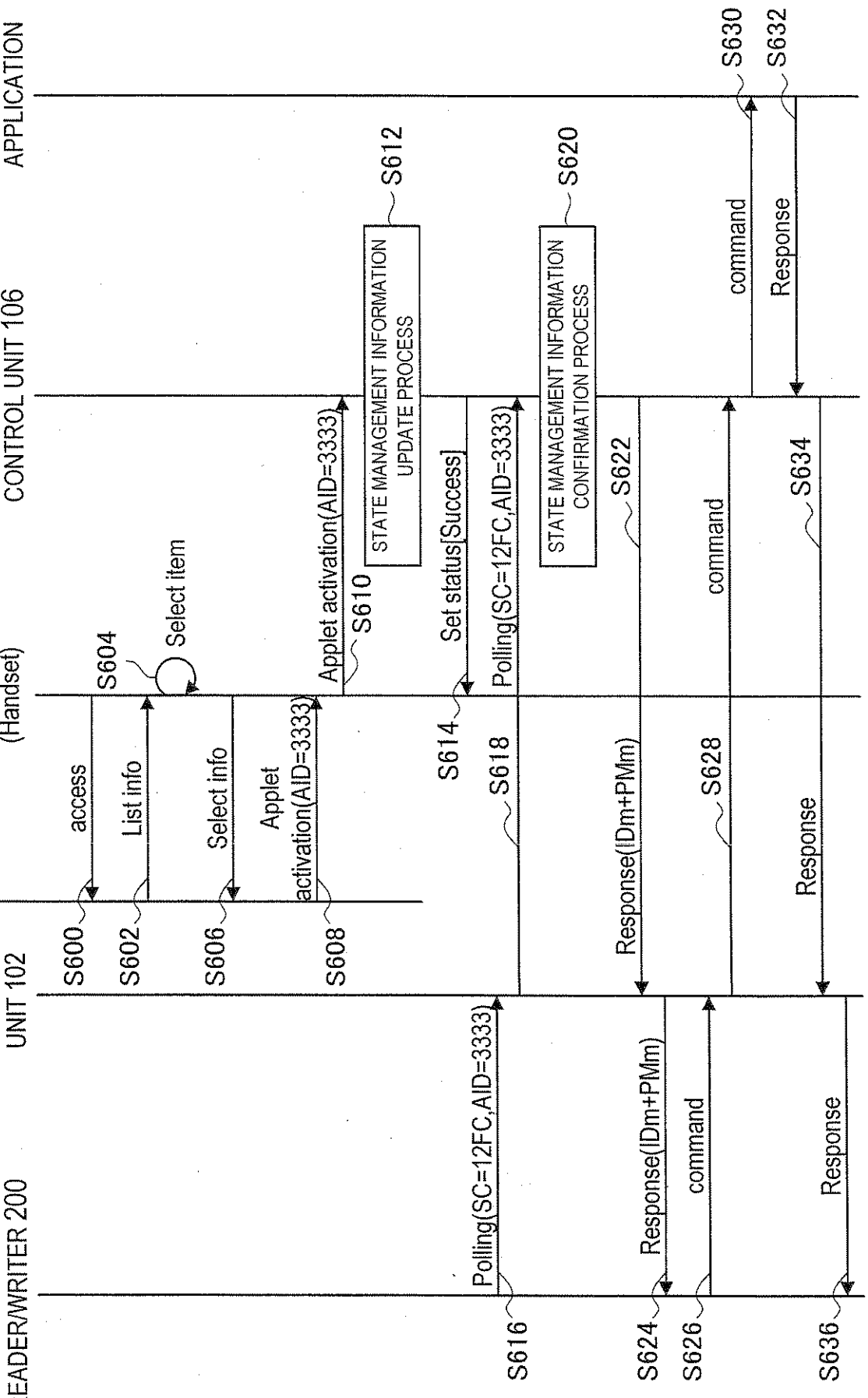
A

	SC	AID	IDm	PMm	MF
1	0003	1111	11	FF	T
2	FE00	2222	22	FF	T
3	12FC	3333	33	FF	F
4					

B

	SC	AID	IDm	PMm	MF
1	0003	1111	11	FF	T
2	12FC	3333	22	FF	T
3					
4					

FIG. 21


READER/WRITER 200
COMMUNICATION UNIT 102
SERVER
Base band chip (Handset)
CONTROL UNIT 106
APPLICATION
S600
access
S602
List info
S604
Select item
S606
Select info
S608
Applet activation(AID=3333)
S610
Applet activation(AID=3333)
STATE MANAGEMENT INFORMATION UPDATE PROCESS
S612
S614
Set status[Success]
S616
Polling(SC=12FC,AID=3333)
S618
Polling(SC=12FC,AID=3333)
STATE MANAGEMENT INFORMATION CONFIRMATION PROCESS
S620
S622
Response(IDm+PMm)
S624
command
S626
command
S628
command
S630
Response
S632
Response
S634
Response
S636