

Motorola Two Way Encryption Modules By Radio Series

During internal examination, it is quite common for factory installed secure boards to be labeled with the "blank" UCM part numbers. Field installed (retrofit) kit part numbers will be properly labeled as they originate from national parts. AES-256 field installed UCM upgrades are becoming VERY common. The most thorough method of identifying the algorithms loaded into the secure module is to place the radio into test mode - which will also reveal the firmware revision of the UCM. EMC firmware is EXTREMELY important to ensure compatibility with the HOST firmware. Current XTS5000/XTL5000 EMC firmware is 5.05.02. Current XTS3000 firmware is EMC3.58 (or higher).

UCM internal FIRMWARE may be upgraded during the CPS-driven "FLASHPORT" process. UCM Algorithms may be added using an appropriately equipped KVL3000/KVL3000+ key variable loader using PCMCIA (PC Cards) loaded into the KVL 3000 / 3000+. These upgrades are ordered as flashport upgrades using the standard Motorola sales forms.

	Algo 1	Algo 2	Algo 3	Algo 4	Algo 5	UCM?	Cancelled?	Superceded By:	Notes
XTS 3000									XTS 3000 UCM modules require HOST firmware > 7.xx to function. EMC secure modules with firmware (1.xx-2.xx) will function if CKR key management is DISABLED and PID key management is ENABLED in the CPS. The "V67" module is very common in the second-hand market. This module is USUALLY loaded with DES, DES-XL and DES-OFB encryption (i.e. it's a NTN9121 module without labeling). When you see one with this part number on it, you can safely assume that it's a tri-mode DES/DES-XL/DES-OFB module.
"Cosmo"									
NTN8253	DES						Y	NTN9121	
NTN8254	DES-XL						Y	NTN9121	
NTN8255	DES-OFB						Y		
NTN8256	DVI-XL								
NTN8257	DVP-XL					Y			
NTN8258	DES-XL	DES-OFB					Y	NTN9121	
NTN8259	DVP-XL	DES-OFB				Y			
NTN8260	DES-XL	DVP-XL				Y	Y		
NTN8261	DVP-XL	DVI-XL							
NTN8326	DVI-XL	DES-OFB					Y		
NTN8418	DES	DES-OFB					Y	NTN9121	
NTN8328	DVP						Y		
NTN8329	DVI-XL	DVP					Y		
NTN8330	DES-XL	DVP					Y		
NTN8331	DVP-XL	DVP					Y		
NTN8705	DES-OFB	DVP							
NTN9121	DES	DES-XL	DES-OFB			Y			
NNTN4432	AES-256					Y			
NNTN4433	AES-256	DES-XL	DES-OFB			Y			
0105956V67	DES-XL	DES-OFB							

	Algo 1	Algo 2	Algo 3	Algo 4	Algo 5	UCM?	Cancelled?	Superceded By:
XTS3500								
"Kramer"								
NTN8587	DES-OFB							
NTN8588	DES-XL							
NTN8598	DVI-XL							
NTN8599	DVP-XL							
NTN8600	DES-XL	DES-OFB						
NTN8604	DVP						Y	

	Algo 1	Algo 2	Algo 3	Algo 4	Algo 5	UCM?	Cancelled?	Superceded By:	Notes
XTS5000									NTN5032 appears to be the "blank" unflashed UCM module. Beware when encountering these as the algorithms flashed into the device can only be determined by installing the module into the radio and then
NNTN4006	DES	DES-XL	DES-OFB			Y			
NNTN4197A	AES-256					Y			
NNTN4198A	AES-256	DES-XL	DES-OFB			Y			
NNTN4593	ADP					Y			
NNTN4594	ADP	AES-256				Y			
NNTN4595	ADP	DES	DES-XL	DES-OFB		Y			
NNTN4596	ADP	AES-256	DES	DES-XL	DES-OFB	Y			

NNTN4941		DES	DES-XL	DES-OFB				Y		
NNTN4935		AES-256						Y		
NNTN4936		AES-256	DES	DES-XL	DES-OFB			Y		
NNTN4937		ADP						Y		
NNTN4932		ADP	AES-256					Y		
NNTN4933		ADP	DES	DES-XL				Y		
NNTN4934		ADP	AES-256	DES	DES-XL	DES-OFB		Y		
NNTN4939		DES	DES-XL	DVP-XL				Y		
NNTN4938		DVI-XL						Y		
NNTN4940		DVP-XL						Y		

HLN6876 is the 3 day key retention module. HLN6877 is the 30 second key retention module. One of these two modules is required to install a secure module into the XTL 5000. ADP hardware encryption requires a KVL3000+ to load. NNTN5032 is a "blank" unprogrammed UCM.

	Algo 1	Algo 2	Algo 3	Algo 4	Algo 5	UCM?	Cancelled?	Superceded By:	Notes
Astro Digital Saber									
								Also seen as:	
NTN1146	DVP							NTN7770	
NTN1152	DES							NTN7771	
NTN1153	DES-XL							NTN7772	
NTN1158	DVI-XL							NTN7773	
NTN1147	DVP-XL							NTN7774	
NTN1367	DVI-XL	DVP						NTN7329	
NTN1368	DES-XL	DVP						NTN7332	
NTN1369	DES-XL	DVP-XL						NTN7731	
NTN1370	DVP	DVP-XL						NTN7330	
NTN1371	DVP-XL	DVI-XL						NTN7370	
NTN8967	DES-XL	DES-OFB				Y			
NTN1562	DES-OFB								

UCM modules for Astro Saber require HOST firmware >7.xx. NTN 1712 appears to have replaced the NTN7771, NTN7772, NTN1152, NTN1153 and NTN1562 modules. Note that NTN1712 is a UCM and requires recent host firmware to function.

	Algo 1	Algo 2	Algo 3	Smartnet?	Multikey?	OTAR?	Cancelled?	Superceded By:	Notes
Saber Analog									
NTN4711	DVP						Y		
NTN4712	DES						Y		
NTN4713	DVP-XL						Y		
NTN4714	DES-XL						Y		
NTN4720	DUMMY						Y		Can be metal (silver) or plastic
NTN5832	DVP			Y			Y		
NTN5833	DES			Y			Y	NTN1072	
NTN5834	DVP-XL			Y			Y	NTN1073	
NTN5835	DES-XL			Y			Y	NTN1071	
NTN5755	DVP				Y		Y		
NTN5756	DVP-XL				Y		Y		
NTN5757	DES				Y		Y		
NTN5758	DES-XL				Y		Y		
NTN5759	DVI-XL				Y		Y		
NTN5760	DVP					Y	Y		
NTN5761	DVP-XL					Y	Y		
NTN5762	DES					Y	Y		
NTN5763	DES-XL					Y	Y		
NTN7288	DVP				Y		Y	NTN5755	
NTN7289	DVP-XL				Y		Y	NTN5756	

SMARTNET modules are designed for SYSTEMS Saber. The NTN5832, 5833, 5834 and 5835 types will function in Saber I/II/III. NTN47xx modules will NOT function in SYSTEMS Saber radios. OTAR modules are multikey by default. NTN7298 and NTN5874 modules are Controlled Cryptographic Modules (CCI's) and should not be in the public domain.

NTN7290		DES				Y		Y	NTN5757
NTN7291		DES-XL				Y		Y	NTN5758
NTN7292		DVP-XL				Y		Y	NTN5759
NTN7298		Fascinator						Y	Also can be NTN1089
NTN5874		Fascinator			Y			Y	Also can be NTN1094

		Algo 1	Algo 2	Algo 3	Algo 4	Algo 5		Cancelled?	Superceded By:
Analog Spectra									
TRN4836		DES						Y	
TRN6777		DVP						Y	
TRN7036		DES-XL							
TRN7037		DVI-XL						Y	
TRN7038		DVP-XL							

Notes

HLN6000A/B is the VHF/UHF carrier board. HLN6202 is the 800MHz carrier board (FRED). Reports indicate that the 800MHz board works fine in a VHF/UHF radio. Note that these hybrids are also used in Syntor x9000 mobiles (both the internal and external physical security housing models) and in all of the T30xx variant keyloaders.

		Algo 1	Algo 2	Algo 3	Algo 4	Algo 5		Cancelled?	Superceded By:
MTS2000									
NTN7279		DES						Y	REX-4581
NTN7280		DES-XL							
NTN7281		DVP						Y	
NTN7282		DVP-XL							REX4580
NTN7283		DVI-XL							REX4578

		Algo 1	Algo 2	Algo 3	Algo 4	Algo 5		Cancelled?	Superceded By:
MCS2000									
HLN1407		DES	3 day					Y	HLN6575 (cancelled)
HLN1416		DES	long term						HLN6587
HLN1408		DES-XL	3 day						HLN6576
HLN1414		DES-XL	long term						HLN6585
HLN1409		DVP	3 day						HLN6577
HLN1415		DVP	long term					Y	HLN6586 (cancelled)
HLN1410		DVP-XL	3 day						HLN6578
HLN1413		DVP-XL	long term					Y	HLN6584 (cancelled)
HLN1411		DVI-XL	3 day						HLN6579
HLN1412		DVI-XL	long term						HLN6583

Notes

HLN14xx numbers are the retrofit kit numbers. The modules should have either the HLN 14xx number *OR* the HLN 65xx number on the carrier board.

Both numbers are included for clarity. Note: MTS 2000 modules use the same physical connector but I have not tested / verified if they work.

		Algo 1	Algo 2	Algo 3	Algo 4	Algo 5		Cancelled?	Superceded By:
STX									
NTN4986		DVP-XL						Y	
NTN4937		DES-XL						Y	
NTN6583		DVI-XL						Y	

		Algo 1	Algo 2	Algo 3	Algo 4	Algo 5		Cancelled?	Superceded By:
MX Series									
NLE9020		DVP						Y	
NLD7890		DVP						Y	
NLD7900		DES						Y	
NLD8570		DVP						Y	
NLD8470		DES						Y	

Motorola Key Variable Loaders

	Algorithm						
	DVP	DVP-XL	DES	DES-XL	DES-OFB	DVI-XL	AES-256
T3010	X						
T3011			X	X	X		
T3014		X					
T3012						X	
T3013						X	
T3020			X				
KVL 3000	X	X	X	X	X	X	
KVL 3000+		X	X	X	X	X	X

KVL3000+ can also load UCM-based ADP encryption - but flash determines algos in the loader.

Keyloader Cable Part Numbers

TDN9390	MTS 2000 and all XTS 2500 / 3000 / 3500 / 5000 portables
TKN8209	MX series (also used to clone keys from KVL to KVL)
TKN8210	Micor, Spectra-tac comparator, SIU, portable repeater
TKN8506	Saber, SYSTEMS Saber and Astro Saber
TKN8516	Saber to Security Interface Box (SIB) - Fascinator Encryption only
TKN8531	Expo, Syntor9000, Spectra and Astro Spectra (with adapter TRN7414) MSF5000, MGEG, XTL 5000 Wx series ctrl heads (with adapter TRN7414)
TKN9152	MCS2000
TKN8229	Syntor, Syntor X, MCX100, MCX1000
TKN8584	RS232 cable for T30xx series
CLN6324	KVL 3000 to Modem DB9
CKN6686	XTS4000
HKN6182	XTL GCAI High Power ("O" series control heads using new mic)

Note: All of these cables are cross compatible between T30xx series and the KVL3000 except the TKN8584

6881090E26	T3011DX Operators Manual
6881132E29	KVL3000+ Users Manual
6880802E55	KVL3000+ Service Manual
6881131E16	KVL3000 Users Manual

Notes

The T3010 DVP keyloader will NOT load DVP-XL.
The T3014 DVP-XL keyloader will NOT load DVP.
The T3020 DES keyloader will NOT load DES-XL or DES-OFB.

Each of the legacy (T30xx) series keyloaders can be had in different firmware revisions (A, B, C and D).

A and B series loaders will work on everything up to and including the systems saber.

C series loaders are required to load the MTS2000 portable and MCS2000 mobile. Motorola documentation indicates that a "D" model loader is required for Astro products.

The T3012 DVI-XL keyloader is the full-featured "Supervisor" model that allows key variable data entry. The T3013 is the "Operator" model and does NOT allow key variable entry. Keys for the T3013 must be cloned into the device from another T3013 or from a Supervisor model T3012.

KVL3000 is capable of holding DES and any ONE other algorithm (i.e. DES and DVP-XL). KVL3000+ does NOT support DVP encryption (but it does support DVP-XL). KVL3000+ is required to support hardware ADP encryption (must be flashed for it).

To load encryption keys into XTS 5000 / XTL 5000 products using a T3011DX series keyloader - PID KEY MANAGEMENT *MUST* first be enabled in the radio codeplug using CPS.