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SUBJECT: Allison DOC® for 6th Generation Controls Release

MODELS AFFECTED: All 1000, 2000, 3000, and 4000 Series Transmissions

Introduction:

To align with Allison's 6th Generation Controls, Allison DOC[®] Subscription, V2021.3 was released in October 2021. V2021.3 builds on some basic 6th Generation support that was added in prior Allison DOC[®] releases and included the 1000 and 2000 Series and 3000 and 4000 Series troubleshooting manuals.

6th Generation Cybersecurity:

Allison has introduced new product cybersecurity measures in 6th Generation Controls to protect the integrity and security of our products and systems. These new cybersecurity measures require that the Allison DOC[®] software is able to authenticate with the TCM when performing reprogramming and most action requests. Allison DOC[®] software authenticates with the TCM by performing a certificate exchange with the TCM and retrieving a challenge response from Allison's Product Cybersecurity Services (PCS) system. The authentication process requires either the Allison DOC[®] software to have a real-time internet connection to PCS or the installation of a cybersecurity USB dongle on the same computer with the Allison DOC[®] software. More details regarding the cybersecurity USB dongle are provided later in this SIL.

NOTE: Only Allison DOC[®] Premium licenses require authentication. Allison DOC[®] Fleets licenses do not require authentication because reprogramming is not available in Allison DOC[®] Fleets licenses. Also, none of the action requests requiring authentication are available with Allison DOC[®] Fleets licenses.

Reprogramming with Online Connection to PCS:

When reprogramming a 6th Gen TCM while connected to the internet, the Allison DOC[®] user must log into PCS. Either TCM Reflash[™] account credentials or Allison HUB[™] account credentials can be used to log into PCS through Allison DOC[®]. If the user has both TCM Reflash[™] and Allison HUB[™] account credentials, the TCM Reflash[™] credentials are preferred.

NOTE: It is important to remember that when using TCM Reflash[™] credentials to log into PCS, the password must be entered in all caps. This is only applicable to logging into PCS. When logging into TCM Reflash[™], the password can be entered as normal (mixed case).

When the "Reprogram" menu is selected while connected to a 6th Gen TCM, the pop-up shown in Figure 1 will be displayed. Since this section of the SIL discusses an online connection, the user will select the radio button "yes" for the question "Will this PC have internet access during 6th Gen TCM reprogramming and action requests?". The user must then enter the appropriate credentials and select "Access PCS". If the credentials are valid, the user will

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see a success response as shown in Figure 2. Clicking "OK" to the pop-up in Figure 2 allows the user to proceed with reprogramming the 6th Gen TCM in the same way that 5th Gen TCMs are reprogrammed.

S Allison Security (6th Gen)		- 0	×
Jnable to obtain tool certificates. Please e	nter PCS credentials or unlock USB Dongle.		
Vill this PC have Internet access during 6	h Gen TCM reprogramming and action reques	sts?	◯ No
TCM Reflash or HUB Credentials	Unlock USB Dongle	Adv	anced
User Name	Current PIN:	Nev	v USB
Access PCS	Unlock USB Dongle	С	ancel





Figure 2.

Reprogramming Offline with USB Dongle:

When reprogramming a 6th Gen TCM while offline, the Allison DOC[®] user must have an Allison cybersecurity USB dongle installed on the same computer with the Allison DOC[®] software. When the "Reprogram" menu is selected while connected to a 6th Gen TCM, the pop-up shown in Figure 3 will be displayed. Since this section of the SIL discusses being offline, the user will select the radio button "no" for the question, "Will this PC have internet access during 6th Gen TCM reprogramming and action requests?". The user will then enter the PIN assigned to the USB dongle and select "Unlock USB Dongle". If the PIN is valid, the user will see a success response as shown in Figure 4, which also includes the number of remaining signs left on the USB dongle (more information on USB dongle is contained in a later section of this SIL). Clicking "OK" to the pop-up in Figure 4 allows the user to proceed with reprogramming the 6th Gen TCM in the same way that 5th Gen TCMs are reprogrammed.

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S Allison Security (6th Gen)		-		×
Unable to obtain tool certificates. Please e	nter PCS credentials or unlock USB Dongle.			
Will this PC have Internet access during 6	th Gen TCM reprogramming and action requests?	C	Yes 🤅	No
TCM Reflash or HUB Credentials	Unlock USB Dongle Current PIN:		Advanc	ced
Password			New U Cano	ISB cel
Access PCS	Unlock USB Dongle			

Figure 3.

Allison Security (6th Gen)		×
Get Dongle Status [0]: Succe	ess; #signs left=5	0
	ОК	

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Performing Action Requests with Online Connection to PCS:

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When performing action requests on a 6th Gen TCM while connected to the internet, the Allison DOC[®] user must log into PCS. Similar to reprogramming, either TCM ReflashTM account credentials or Allison HUBTM account credentials can be used to log into PCS through Allison DOC[®]. If the user has both TCM ReflashTM and Allison HUBTM account credentials, the TCM ReflashTM credentials are preferred.

NOTE: It is important to remember that when using TCM ReflashTM credentials to log into PCS, the password must be entered in all caps. This is only applicable to logging into PCS. When logging into TCM ReflashTM, the password can be entered as normal (mixed case).

Not all action requests require authentication with the TCM. A list of action requests requiring authentication is shown in Table 1. When an action request requiring authentication is selected from the "Action Request" menu while connected to a 6th Gen TCM, the pop-up shown in Figure 1 will be displayed. Since this section of the SIL discusses an online connection, the user will select the radio button "yes" for the question "Will this PC have internet access during 6th Gen TCM reprogramming and action requests?" The user must then enter the appropriate credentials and select "Access PCS". If the credentials are valid, the user will see a success response as shown in Figure 2. Clicking "OK" to the pop-up in Figure 2 allows the user to proceed with performing the action request on the 6th Gen TCM in the same way that 5th Gen TCMs action requests are performed.

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Table 1. Action Request Authentication

Action Request	Authentication
Clutch Test Enabled	Required
Solenoid Test	Required
Reset Adaptive Shift Parameters	Not required
Clear All Shift Adaptive Parameters	Not required
Reset Throttle Calibration	n/a
Reset Full Throttle Calibration (TPS only)	Required
Reset Closed Throttle Calibration (TPS only)	Required
Lamp Tests	n/a
Transmission Fault Lamp Test	Required
Reverse Warning Lamp Test	Required
Service Indicator Lamp Test	Required
Neutral Start Lamp Test	Required
Reset Auto-Detect Oil Level Sensor	Not required
Reset Auto-Detect Retarder	Not required
Reset SAE J1939	Required
Reset Accelerometer Learning Information	Required
Accelerometer Learning	Required
Reset Prognostics Information	n/a
Reset Oil Life Monitor	Not required
Reset Filter Life Monitor	Not required
Reset Transmission Health Monitor	Not required
Engineering Calculations	Not required
Output Tests	Required
Upload Current TCM Configuration	Not required

Performing Action Requests Offline with USB Dongle:

When performing action requests on a 6th Gen TCM while offline, the Allison DOC[®] user must have an Allison cybersecurity USB dongle installed on the same computer with the Allison DOC[®] software. The of list of action requests requiring authentication shown in Table 1 also applies when using the USB dongle offline.

When an action request requiring authentication is selected from the "Action Request" menu while connected to a 6th Gen TCM, the pop-up shown in Figure 3 will be displayed. Since this section of the SIL discusses an offline connection, the user will select the radio button "no" for the question "Will this PC have internet access during 6th Gen TCM reprogramming and action requests?". The user will then enter the PIN assigned to the USB dongle and select "Unlock USB Dongle". If the PIN is valid, the user will see a success response as shown in Figure 4, which also includes the number of remaining signs left on the USB dongle (more information on USB dongle is contained in a later section of this SIL). Clicking "OK" to the pop-up in Figure 4 allows the user to proceed with performing the action request on the 6th Gen TCM in the same way that 5th Gen TCMs action requests are performed.

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Allison Cybersecurity USB Dongle: Initial Setup:

As mentioned earlier, offline authentication with a 6th Gen TCM requires a cybersecurity USB dongle. The USB dongle is unique to Allison Transmission. Allison DOC[®] users can purchase the cybersecurity USB dongle from Noregon Systems' Allison Web Store (*https://allisonstore.noregon.com/collections/cybersecurity-e-tools*).



NOTE: The Allison cybersecurity USB dongle is an Allison Essential Tool.

Cybersecurity USB dongles must be set-up, or provisioned, before they can be used. The provisioning process is described below:

- 1. Insert USB dongle to PC's USB port and ensure the white LED illuminates. If it does not illuminate, remove and reinsert the USB dongle.
- 2. Open Allison DOC[®].
 - a. From Allison DOC[®], go to the "Help" menu and select "Allison Security (6th Gen)", then select the "Advanced" button as shown in Figure 5.

Allison Security (6th Gen)		- C	x u
Will you be connecting to a 6th Gen TCM and	reprogramming or performing action requests?	⊖ Yes	No
Will this PC have Internet access during 6th G	ien TCM reprogramming and action requests?	⊖ Yes	O No
TCM Reflash or HUB Credentials	Unlock USB Dongle Current PIN:	Adv	vanced w USB
Access PCS	Unlock USB Dongle	(ancel

Figure 5.

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3. After the "advanced" window opens, click the "New USB" tab as shown in Figure 6.

Allison Sec	curity (6th Gen)		— C	X C
Allison Certificat	certificates are necessa es are available through	ry for full 6th gen TC M fur USB Dongle (offline) or F	ctionality. PCS (online	e).
Offline Access	Online Access New USB			
Change PIN	New PIN:	TCM Reflash or HUB Crede Use TCM Reflash login Use HUB login User Name Password	ntials	
	Change PIN	Provision USE	Dongle	
PIN must be from then set a new f	n 6 to 16 digits long. Too many wror PIN and provision the USB Dongle.	ng PIN attempts results in the USB D Access to PCS is necessary for prov	ongle being res isioning. Get Dongle	et; you must e Status
			Get Certifica	te Status
			Install Root C	ertificates
		Close		

Figure 6.

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4. Enter your PIN in the "New PIN" and "Confirm PIN" boxes. Click the "Change PIN" button as shown in Figure 7.

Allison Security (6th Gen)	— 🗆 X
Allison certificates are necessary f Certificates are available through US	or full 6th gen TCM functionality. B Dongle (offline) or PCS (online).
Offline Access Online Access New USB	
Change PIN	- TCM Reflash or HUB Credentials
New PIN:	Use TCM Reflash login
Confirm PIN:	🔿 Use HUB login
	User Name
	Password
Change PIN	Provision USB Dongle
PIN must be from 6 to 16 digits long. Too many wrong PI then set a new PIN and provision the USB Dongle. Acce	N attempts results in the USB Dongle being reset; you must ess to PCS is necessary for provisioning. Get Dongle Status
	Get Certificate Status
	Install Root Certificates
C	ose

Figure 7.

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5. After the PIN is set, indicate whether the credentials are for TCM Reflash[™] or the Allison HUB[™] by selecting the radio button as shown in Figure 8. Enter your credentials.

NOTE: If the user has a TCM Reflash[™] account and a HUB[™] account, the TCM Reflash[™] account should be used to provision the USB dongle.

Certifica	certificates are necessary les are available through U	for full 6th gen TC M functionality. SB Dongle (offline) or PCS (online).
Offline Access	Online Access New USB	
Change PIN	New PIN:	TCM Reflash or HUB Credentials Use TCM Reflash login Use HUB login User Name XXXXXX Password
	Change PIN	Provision USB Dongle
	n 6 to 16 digite long . Too many wong F	PIN attempts results in the USB Dongle being reset; you mus
PIN must be from hen set a new Thange PIN [0]: Iccess PCS [0]	PIN and provision the USB Dongle. Acc Success Success	Get Dongle Status

Figure 8.

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- 6. Click "Provision USB Dongle".
- 7. A success message "Provision USB Dongle [0]: Success" should appear.

Allison Cybersecurity USB Dongle: Checking and Recharging USB Dongle Signs:

Once a USB dongle has been provisioned, it has a limited number of "signs" that can be used to establish an authenticated session with the TCM in order to perform action requests or reprogramming events when offline. Each time the USB dongle is used to enter an authenticated session, the number of signs remaining on the USB dongle decreases by one. Once an authenticated session is opened, multiple action requests can be performed within the same session without decreasing the number of signs. Only one reprogramming event is allowed per authentication session, but in general, multiple parameters can be modified a single reprogramming event. (Changing active function packages cannot be changed on the same reprogramming event as other individual parameters.)

To check the number of signs remaining on the USB dongle, perform the following process:

1. Insert USB dongle to PC's USB port and ensure the white LED illuminates. If it does not illuminate, remove and reinsert the USB dongle.

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- 2. Open Allison DOC[®].
 - a. From Allison DOC[®], go to the "Help" menu and select "Allison Security (6th Gen)", then select the "Advanced" button as shown in Figure 9.



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3. After the "advanced" window opens, click the "Offline Access" tab as shown in Figure 10.

Allison Secu	rity (6th Gen)		— 🗆 X
Allison c Certificate	ertificates are necessar s are available through l	y for full 6th gen TC M fu USB Dongle (offline) or	nctionality. PCS (online).
Offline Access	Online Access New USB		
Unlock USB Do	ment PIN:	Change PIN New PIN: Confirm PIN:	
	Unlock USB Dongle	Change	e PIN
PIN must be from 6 hen set a new PIN	S to 16 digits long. Too many wrong N and provision the USB Dongle. A	PIN attempts results in the USB E ccess to PCS is necessary for prov	Dongle being reset; you mus risioning.
aet Dongle Status	[U]: Success; #signs left=50		Get Dongle Status
			Get Certificate Status
			Install Root Certificates
		Close	

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Figure 10.

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 Enter the USB dongle PIN and select "Unlock USB Dongle". The response will indicate "Get Dongle Status [0]: Success; #signs left=XX", in which XX is equal to the number of remaining signs. In the example in Figure 10, 50 signs are left on the USB dongle.

When the number of signs on the USB dongle is zero or near zero, it will be necessary to recharge the signs on the USB dongle. To recharge the USB dongle, perform the following process:

- 1. Insert USB dongle to PC's USB port and ensure the white LED illuminates. If it does not illuminate, remove and reinsert the USB dongle.
- 2. Open Allison DOC[®].
 - a. From Allison DOC[®], go to the "Help" menu and select "Allison Security (6th Gen)", then select the "Advanced" button as shown in Figure 11.

O Allison Security (6th Gen)		- C	x u
Will you be connecting to a 6th Gen TCM ar	nd reprogramming or performing action requests?	⊖ Yes	No
Will this PC have Internet access during 6th	Gen TCM reprogramming and action requests?	⊖ Yes	O No
TCM Reflash or HUB Credentials	Unlock USB Dongle	Adv	anced
User Name	Current PIN:	Net	w LISB
Password		(Cancel
Access PCS	Unlock USB Dongle		

Figure 11.

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3. After the "advanced" window opens, click the "Online Access" tab as shown in Figure 12.

Allison Security (6th Gen)	_		×
Allison certificates are necessary for full 6th gen TCM ful Certificates are available through USB Dongle (offline) or	nctionalit PCS (onli	y. ine).	
Offline Access Online Access New USB			
TCM Reflash or HUB Credentials	Provision L	ISB Dong	e –
Use TCM Reflash login			
O Use HUB login	Current PIN:		
Click here to get Allison HUB account: https://hub.allisontransmission.com			
User Name			_
Password	Provisio	on USB	
Access PCS	Dor	ngle	
PIN must be from 6 to 16 digits long. Too many wrong PIN attempts results in the USB then set a new PIN and provision the USB Dongle. Access to PCS is necessary for pro-	Dongle being ovisioning.	reset; you	must
	Get Dor	ngle Statu	s
	Get Certif	icate Stat	us
	Install Roo	t Certifica	tes
Close			

Figure 12.

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4. Enter your TCM Reflash[™] or HUB[™] credentials (whichever was used to initially provision the USB dongle) as shown in Figure 13.

Allison Security (6th Gen)			×
Allison certificates are necessary for full 6th gen TCM fu Certificates are available through USB Dongle (offline) or	nctionalit PCS (onl	y. ine).	
Offline Access Online Access New USB			
TCM Reflash or HUB Credentials	- Provision l	JSB Dongle	e
 Use TCM Reflash login Use HUB login Click here to get Allison HUB account: <u>https://hub.allisontransmission.com</u> 	Current PIN:		
User Name Password Access PCS	Provisi Do	on USB ngle	
PIN must be from 6 to 16 digits long. Too many wrong PIN attempts results in the USB I then set a new PIN and provision the USB Dongle. Access to PCS is necessary for pro	Dongle being visioning.	reset; you	must
	Get Do	igle status	
	Get Certi	ficate Statu	JS
	Install Roo	ot Certificat	es
Close			

Figure 13.

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5. After the PCS is accessed ("Access PCS [0]: Success" will display in the dialogue box), enter the current PIN as shown in Figure 14.

C Allison Security (6th Gen)	— 🗆 X	<		
Allison certificates are necessary for full 6th gen TCM functionality. Certificates are available through USB Dongle (offline) or PCS (online).				
Offline Access Online Access Ne	w USB			
TCM Reflash or HUB Credentials		Provision USB Dongle	7	
 Use TCM Reflash login Use HUB login Click here to get Allison HUB account: <u>https://hub.allisontransmission.com</u> 		Current PIN:		
User N Passi	Vame XXXXXX word Access PCS	Provision USB Dongle		
PIN must be from 6 to 16 digits long. Too many wrong PIN attempts results in the USB Dongle being reset; you must then set a new PIN and provision the USB Dongle. Access to PCS is necessary for provisioning.				
Access PCS [0]: Success		Get Dongle Status		
		Get Certificate Status		
		Install Root Certificates		
Close				

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Figure 14.

6. Click "Provision USB Dongle".

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7. A success message should appear indicating the number of signs before and after provisioning as shown in Figure 15.

Allison Security (6th Gen)		$ \square$ \times
Allison certificat Certificates are av	es are necessary for full 6th g railable through USB Dongle (en TCM functionality. offline) or PCS (online).
Offline Access Online Acce	New USB	
 TCM Reflash or HUB Cred Use TCM Reflash login Use HUB login Click here to get Allison 	HUB account: https://hub.allisontransmis: User Name XXXXXX	Provision USB Dongle Current PIN:
PIN must be from 6 to 16 digit	Access PCS	ts in the USB Dongle being reset; you must
Access PCS [0]: Success	sion the USB Dongle. Access to PCS is ner	Get Dongle Status
Access PCS [U]: Success Get Dongle Status [0]: Success; #signs left=49 Provision USB Dongle [0]: Success Get Dongle Status [0]: Success; #signs left=50		Get Certificate Status
		Install Root Certificates
	Close	

Figure 15.

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Technical Support:

For technical support regarding the Allison DOC[®] V2021.3 or the cybersecurity USB dongle, please contact Noregon Systems by phone or email:

TOLL FREE: U.S. and Canada: 877-659-6913 INTERNATIONAL: 1-336-970-5534 DOCsupport@noregon.com

For issues with TCM Reflash[™] or Allison HUB[™] login credentials, please email hub@allisontransmission.com.