Bridge Setup (V1 HW to V2 HW)

This document will help with the setup of a wireless bridge using EnGenius prodcuts without the EnJet technology. V1 of the EnGenius bridging hardware does not support the EnJet technology.

The steup guide will be how to setup a PtP (Point to Point) wireless link.

In the figure a PtP wireless bridge is setup to connect to remote networks.



Figure 1: Wireless Bridge for two Networks

In the figure below a PtP wireless bridge is setup to connect a hardwired IP camera to an NVR wirelessly.



Figure 2: Wireless Bridge for IP Camera

Note: *PtP links will yield the best performance. We recommend that network requirements be calculated before deploying a PtMP wirelss bridge links.*

Step up of HW V1

The first step after login into the unit is to give the unit a static IP address. It is recommend that the unit be given a static IP address in the same subnet as the management subnet and outside the DHCP scope of the DHCP server.

< Network	
Basic	
Wireless	
IPv4 Settings	
IP Network Setting	DHCP Static IP
IP Address	172.16.25.25
Subnet Mask	255.255.255.0
Gateway	172.16.25.1
Primary DNS	8.8.8.8
Secondary DNS	8.8.4.4

Figure 3: Static IP address applied to unit

After setting the IP address click the Apply button at the bottom of the screen. This will que the setting, but the setting is not fully applied unit you follow the next steps.

EnGeniius®				Englis	h
EnStationAC	Single Radio AP , 2T2R , 867Mbps		Changes: 0	Reset	Logout
OverView	IPv4 Settings				
Device Status	IP Network Setting	OHCP Static	IP		
Connections	IP Address	10.0.89.63			
Network	Subpat Mack	255 255 255 0			
Basic	Subher Mask	233.233.233.0			
Wireless	Gateway	10.0.89.1			
Management	Primary DNS	8.8.8.8			
Time Zone	Secondary DNS	8844			
WiFi Scheduler		0.0.1.1			
Tools					
System Manager	IPv6 Settings	Link-local A	ddress		
Account					
Firmware	IP Address				
Log	Subnet Prefix Length				
	Gateway				
	Primary DNS				
	Secondary DNS				
	Spanning Tree Protocol (STP) Se	ttings ○ Enable ◎ Disat	ble		
	Hello Time	2	second	is (1-10)	
	Max Age	20	second	is (6-40)	
	Forward Delay	15	second	ls (4-30)	
	Priority	32768	(0-655	35)	
	Save save current setting(s)				

Figure 4: Apply Button at Bottom of screen

There are two locations to apply the settings from the que to the running and startup config of the unit. One is located where arrow is pointing in the figure below 1A, and the other is located where 1B is shown in the figure below.

EnGeniius®							English	
ENS500-AC	Single Radio M	lanagement AP, 2T2R, 86	7Mbps		Change	es: 5	Reset	Logout
						1	Δ	
OverView	Wireless Setti	ngs						
Device Status	Device Name	ENS500-AC						
Connections	Country / Regio	n USA	Ŧ					
Realtime								
Network								
Basic	EnJet🥑							
Wireless	Status	Enable O Disabl	e					
Management								
Advanced				5GHz (A/I	N/AC)			
Time Zone	Operation Mode	2		Access Pr	pint v	🖌 Green 🚺		
WiFi Scheduler					5mm - 1			
Tools	Channel HT Mo	de		40MHz	•			
System Manager	Channel			Configura	ation			
Account	Transmit Power			Auto	v			
Firmware				0.5	c			
Log	Bit Rate			Configura	ation			
	Client Limits			Enable	Disable	1		
				127				
	AP Detection			Scan				
	Distance (0-30k	m)		1 (0.6miles)			
	AP Time Slot			Auto	•			
	Station Priority	9		High	v			
	Wireless Setti	nas - Access Point		_				
	Enabled	SSID	Edit	S	ecurity			
	1	EnGenius79C366	Edit	N	lone	1 C	Waith for change	ges to be applie
						┹┖	Apply	Revert

Figure 5: Two locations to save the settings

If Changes is clicked (shown from figure 5 above) you will be directed to the Configuration/Changes screen. To apply the settings click the apply button, as shown in the figure below.

Configuration / Changes Legend: Section added Section removed Option changed Option removed dhcp.cfg02411c dhcp.cfg02411c.domain=ENS500-AC network.lan network.lan.hostname=ENS500-AC wireless.wifi1 wireless.wifi1.ath count=0 wireless.wifi1.channel_config_status=1 wireless.wifi0_mgmt wireless.wifi0_mgmt.disabled=1 Revert Apply

Figure 6: Apply Button

After clicking the Apply button the changes will be applied to the unit. The unit will have to reboot to apply the settings.

Configuration / Apply

Applying changes			
Waiting for changes to b	e applie	d	
The following changes have bee	n commi	tted:	
Legend: Section added Section re	emoved	Option changed	Option removed
wireless.wifi0_mgmt wireless.wifi0_mgmt.disabled=1			

Figure 7: Applying Changes

If the Apply button is clicked, as shown in figure 5, then the settings will be applied to the unit. The unit will have to reboot for the settings to take effect.

Please note that only the Changes button will give the option to revert the settings in the que before applying the settings to the unit. Only the Apply button, shown in figure 5 1B, will bypass the Configuration/Changes screen and the option to revert changes is not given.

Configuration /	Apply		
Applying changes Waiting for changes to The following changes have be	be applie een commi	d tted:	
Legend: Section added	n removed	Option changed	Option removed
wireless.wifi0_mgmt wireless.wifi0_mgmt.disabled=1			

Figure 8: Applying Settings



The next step is to note the 5GHz BSSID of the radio. This is important for the WDS Bridge connection to the HWv2 (EnJet) unit.

HWv1
88:DC:96:67:00:18
88:DC:11:11:11:11
USA
Fri May 3 20:03:19 20
0h 52m 30s
v3.5.5_c1.9.20
Untagged
7777777

Figure 9: 5GHz BSSID of HWv1 unit

The next step is to set the unit for WDS Bridge. This is found under Network>Wireless>Operation Mode>WDS Bridge. Disable Green mode by unchecking the box to the left of the Green setting.

< Network	_	_	
Basic			
Wireless		-	
Wireless Settings			
Device Name		HWv1	
Country / Region		USA	•
5GHz			
Operation Mode	WD	S Bridge 🔹	Green 🥑
Wireless Mode	Acc Clie	ess Point ent Bridge	
Channel HT Mode	WD	S Access Point	

Figure 10: Settings WDS Bridge and Unchecking Green Mode

After unchecking the Green mode, scroll down to the bottom of the Wireless setup page and click the Save button.

	Outdoor AP, 2T	2R, 867Mb	ps				Changes: 0	Reset	Logo
erView	Wireless Setting	gs							
evice Status	Device Name	HW	v1						
onnections	Country / Region	US/	A		•				
ealtime									
asic						5GHz			
ireless	Operation Mode					WDS Bridg	e 🔻 🗉 Gr	een 🕖	
inagement	Wireless Mode					802.11 AC	N V		
dvanced	Channel HT Mode	в				20MHz			
me Zone	Channel	-				Configurat	in n		
ools	Channel					Comigural	Jon		
stem Manager	Transmit Power					11 dBm	•		
ccount	Bit Rate					Configural	ion		
rmware	Client Limits					Enable 127	O Disable		
og	Multicast to Unice	ust Stream Cr	onversion			9 Epable	🔍 Disable 🙆		
	AP Detection	ar or carried	arrenanari			Scan	- Dialote		
	Distance (0-30km	0				0 (0	milee)		
		,				-	,		
				2345878					
			10	5-63 ASCII	character	rs or 64 hexad	lecimal digits)		
	Caution: NAWDS MAC Address	is enabled, p	dease as:	ign the Ch	character annel on	rs or 64 hexad	ecimal digits) y bands manually Mo	for settings to tak ode	ke effect.
	Caution: NAWDS MAC Address	is enabled, p	lease as:	ign the Ch	annel on	rs or 64 hexad	lecimal digits) y bands manually Mo	for settings to tai ode Inable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p	olease ass	ign the Ch	annel on	s or 64 hexad	lecimal digits) y bands manually Mr E	for settings to tai ode Inable Disable	ke effect. ▼
	Caution: NAWDS MAC Address	is enabled, p	olease ass	ign the Ch	annel on	rs or 64 hexad both frequenc	lecimal digits) y bands manually Mo E E	for settings to tai ode inable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p	olease ass	ign the Ch	annel on	rs or 64 hexad	ecimal digits) y bands manually Mt E	for settings to tak ade Inable Disable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p	olease ass : : : : : : : : : : : : : : : : : : :	ign the Ch	character annel on : [: :	rs or 64 hexad	lecimal digits) y bands manually Mo E E E	for settings to tai ode Inable Disable Disable Disable	ke effect.
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	Caution: NAWDS MAC Address : : : : : : :	is enabled, p) ease ass :; :; :;	+63 ASCII iign the Ch : : : : : : : : : : : : :	character annel on : : : : : : : :	rs or 64 hexad both frequenc	lecimal digits) y bands manually M E E E E E E	for settings to tai inable Disable Disable Disable Disable Disable	ke effect.
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	Caution: NAWDS MAC Address : : : : : : : : : : : : : : : : : :	is enabled, p : : : : : : : : : : : : :	(c) constant (ign the Ch : : : : : : : : : : : : :	annel an i c i c i c i c i c i c i c i c	s or 64 hexad both frequenc	ecimal digits) y bands manually M E E E GHz Enable * Disal	for settings to tai ade inable Disable Disable Disable Disable Disable Disable	ke effect.
	Caution: NAWDS MAC Address : : : : : : : : : : : : : : : : : :	is enabled, p : : : : : : : : : : : : :		ign the Ch : : : : : : : : : : : : :	annel an i c i c i c i c i c i c i c i c	s or 64 hexad both frequenc	ecimal digits) y bands manually M E E GHz Enable * Disal 85 dBm	for settings to tai ade inable Disable Disable Disable Disable Disable Disable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p : : : : : : : : : : : : : : : : : :		ign the Ch		s or 64 hexad both frequenc	GHz GHz Bable ® Disal Bable ® Disal	for settings to tai ade inable Disable Disable Disable Disable Disable Disable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p : : : : : : : : : : : : :	eshold diameet freque	sassociater ently. It is	ecomme	s or 64 hexad both frequenc	GHz	for settings to tai ade inable Disable Disable Disable Disable Disable Disable Disable Disable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p : : : : : : : : : : : : :	reshold diamect frequencies	sassociate anthy. It is	econime	s or 64 hexad both frequenc both s clients that fa inded to disab	GHz GHz Balow the config le bis feature unl	for settings to tai ade inable Disable Disable Disable Disable Disable Disable Disable Disable Disable	ke effect.
	Caution: NAWDS MAC Address	is enabled, p : : : : : : : : : : : : :	eshold dinnect frequencies	sassociates ently. It is	wireless	s or 64 hexad both frequenc	ecimal digits) y bands manually M E E C C C C C C C C C C C C C	for settings to tai ade inable Disable Disable Disable Disable Disable Disable Disable Disable Disable	ke effect.
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Once the Save Button is clicked the unit will display the message as shown in figure 12. Click the Okay button and the unit will reboot. All other changes will require a two-step save/apply process.

172.16.25.101 says
Green mode is changed, system will reload.

Figure 12: Green Mode disabled

Next step is to add the 5GHz BSSID of the other unit, in this case the HWv2, EnJet model, into the WDS Link Settings. It is also recommended that encryption be added as well. In the figure below the 5GHZ BSSID of the HWv2 model has been added to the list.

< Net	work							
Basic		_						
Wireless	5							
WDS Li	nk Sett	tings - 8	5GHz					
Security				AES)		•	
AES Pa	ssphras	se		******** (8-63 A	* SCII char	acters or 64 h	nexadecimal digits)	
Caution:	NAWE setting)S is ena gs to tak	abled, pleas e effect.	se assign th	ie Channe	el on both free	quency bands manually for	
MAC Add	dress					l	Mode	
88	: DC	:	96 :	00 :	00	: 00	Enable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•
	:	:	:	:		:	Disable	•

Figure 13: WDS Link Settings

Below are the best practices for HWv1 for WDS Bridge mode.

< Network	
Basic	
Wireless	
·	5GHz
Operation Mode	WDS Bridge 🔹 🗉 Green 🥑
Wireless Mode	802.11 AC/N •
Channel HT Mode	20MHz •
Channel	Configuration
Transmit Power	11 dBm 🔹
Bit Rate	Configuration
Client Limits	Enable Disable 127
Multicast to Unicast Stream Conversion	💿 Enable 🥑 💿 Disable 🥑
AP Detection	Scan
Distance (0-30km)	0 (Omiles)

Note: Best practices is a starting guide on the configuration of the unit.

Figure 14: HWv1 Best Practices Config

Best Practices in WDS Bridge mode are to use the smallest channel that you can and the lowest Tx output power you can as well. Please ensure the distance settings is set to zero as well.

Next is to configure the proper channel for the WDS Bridge link. Click the Scan button to the right of AP Detection to scan the wireless channels to determine the best channel to place the WDS Bridge link into. The figure below is found on the Network>Wireless>Wireless Settings page.

	5GHz
Operation Mode	WDS Bridge 🔹 🗉 Green 🥑
Wireless Mode	802.11 AC/N •
Channel HT Mode	20MHz •
Channel	Configuration
Transmit Power	11 dBm •
Bit Rate	Configuration
Client Limits	Enable Disable 127
Multicast to Unicast Stream Conversion	🖲 Enable 🥑 🔍 Disable 🥑
AP Detection	Scan
Distance (0-30km)	0 (0miles)

Figure 15: AP Scan

The results of the scan will populate similar to the list shown below.

Note: Depending on the RF environment this might take some time or multiple scans to see all DFS channels.

Site Survey						
BSSID	SSID	Channel	Signal Level	Туре	Security	Mode
88:DC:96:79:C3:4F		36	-55 dBm	11ac	None	Master
88:DC:96:79:C3:F0	EnGenius79C3F0	36	-75 dBm	11ac	None	Master
88:DC:96:41:F5:2A	EnGenius1	44	-29 dBm	11a/n	None	Master
92:DC:96:78:13:0B		48	-65 dBm	11ac	None	Master
8E:DC:96:78:13:0B		48	-64 dBm	11ac	None	Master
88:DC:96:4F:C3:D0		108	-45 dBm	11ac	None	Master
88:DC:96:23:36:4F		153	-35 dBm	11ac	None	Master
88:DC:96:79:C3:57	EnGenius79C357	108	-62 dBm	11ac	None	Master
00:04:56:A0:22:C0	L	36	-39 dBm	11ac	WPA2 -PSK	Master
88:DC:96:79:17:66	IEEE80211	36	-78 dBm	11ac	WPA2 -PSK	Master
88:DC:96:79:28:95	IEEE80211	36	-69 dBm	11ac	WPA2 -PSK	Master
88:DC:96:23:1A:23	EnGenius231A23	40	-65 dBm	11a/n	WPA2 -PSK	Master
88:DC:96:79:17:63	IEEE80211	48	-67 dBm	11ac	WPA2 -PSK	Master
88:DC:96:78:13:0B	EMR3500A	48	-64 dBm	11ac	WPA2 -PSK	Master
A8:6B:AD:F2:A7:B7	WIFIF2A7B3-5G	108	-44 dBm	11ac	WPA2 -PSK	Master
88:DC:96:62:A5:53	EWS550AP	149	-74 dBm	11ac	WPA2 -PSK	Master
88:DC:96:79:28:86	IEEE80211	149	-70 dBm	11ac	WPA2 -PSK	Master
88:DC:96:79:17:54	IEEE80211	108	-48 dBm	11ac	WPA2 -PSK	Master
Repeat scan						

Figure 16: AP Scan Results

In the example shown above the best channel to use in this case is channel 165. Next step is to configure that channel on the unit.

Note: Channel 165 is only available for use with a 20 MHz channel.

To select the channel Click the Configuration button.

	5GHz
Operation Mode	WDS Bridge 🔹 🗉 Green 🥑
Wireless Mode	802.11 AC/N 🔹
Channel HT Mode	20MHz •
Channel	Configuration
Transmit Power	11 dBm ▼
Bit Rate	Configuration
Client Limits	Enable O Disable
Multicast to Unicast Stream Conversion	💿 Enable 🥑 💿 Disable 🥑
AP Detection	Scan
Distance (0-30km)	0 (0miles)

Figure 17: Channel Configuration button

Choose the channel you want the unit to operate in. Then Click the Save button at the bottom of the channel list.



5GHz



Figure 18: Selecting operating Channel

After setting the operating channel click save at the bottom of the page and preform the 2 step save process explained on page 4 of this setup guide.

Changes: 0 Reset Wireless Settings	DOEXT-AC							
Wireless Settings Status Joins Country / Region LBA Country / Region USA SGHz Site Operation Mode WDS Bridge Operation Mode Wireless Mode B0211 ACN Channel HT Mode Channel HT Mode Configuration Transmit Power It defe Client Limits Status Viroless to Unicast Stream Conversion E and Country Operation Grant Distance (0-30km) O WDS Link Settings - 5GHz Security None VDS Link Settings - 5GHz Security None VDS Link Settings - 5GHz Security None AES Passphrase 12245676 (6 63 ASCII characters or 64 hexadecimal digits) Cation: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. Mode : :		Outdoor AP, 2T2R,	867Mbps			Changes: 0	Reset	Logo
Wireless Settings Device Name HWv1 County / Region USA SGHz County / Region USA SGHz SGHz Channel Wireless Mode Channel HT Mode 20MHz Channel Configuration Transmit Power 11 dBm Transmit Power 11 dBm Bit Rate® Configuration Client Limits 122 Multicast to Unicast Stream Conversion Enable © Disable AP Detection Scan Distance (0-30km) 0 (Omiles) WDS Link Settings - 5GHz Security Security None AE S Passphrase (8-63 ASCII characters or 64 hexadecimal digits) Caulton: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode Mode Imaget I								
Status Device Name HWV1 ions County / Region USA SGHiz SGHiz Operation Mode WDS Bridge Wireless Mode B02.11 ACIN id Channel HT Mode Channel HT Mode 20MHz Channel HT Mode Configuration ransmit Power 11 dBm Bit Rate@ Configuration Client Limits 122 Maticast to Unicast Stream Conversion E Enable Distance (0-30km) 0 (0miles) WDS Link Settings - 5GHz WDS Link Settings - 5GHz 12345678 Security None AES Passphrase 12345678 (6-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode I I	View	Wireless Settings						
ions Country / Region USA SGH2 Operation Mode WDS Bridge C Wreless Mode B02.11 ACIN C id Channel HT Mode channel HT Mode 20MHz Channel HT Mode Configuration ransmit Power 11 dBm Bit Rate@ Configuration Client Limits 127 Multicast to Unicast Stream Conversion E Enable © Disable AP Detection Scan Distance (0-30km) 0 (0-30km) 0 WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode I::::::::::::::::::::::::::::::::::::	e Status	Device Name	HWv1					
se state st	ctions	Country / Region	USA		•			
Security None WDS Link Settings - 5GHz WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None 12245678 (6-33 ASCII characters or 64 hexadecimal digits) Cattlon: Number WAC Address 121 Security None Image: 12245678 Image: 122456	ie							
Operation Mode WDS Bridge © Green wireless Mode B02.11 AC/N Image: Channel HT Mode 20MHz Channel HT Mode 20MHz Image: Channel HT Mode 20MHz Manager Channel HT Mode 20MHz Image: Channel HT Mode Image: Channel HT Mode Manager Transmit Power 11 dBm Image: Configuration Image: Client Limits Image: Client Limits Image: Client Limits Image: Client Limits Multicast to Unicast Stream Conversion Image: Client Limits Image: Client Limits Image: Client Limits WDS Link Settings - 5GHz Image: Client Limits Image: Client Limits Image: Client Limits WDS Link Settings - 5GHz Image: Client Limits Image: Client Limits Image: Client Limits WDS Link Settings - 5GHz Image: Client Limits Image: Client Limits Image: Client Limits WDS Link Settings - 5GHz Image: Client Limits Image: Client Limits Image: Client Limits WDS Link Settings - 5GHz Image: Client Limits Image: Client Limits Image: Client Limits Image: Client Limits Security None Image: Client Limits Image: Client Limits Image: Client Limits </th <td>k</td> <td></td> <td></td> <td></td> <td>5GHz</td> <td></td> <td></td> <td></td>	k				5GHz			
Internet Internet Internet Wireless Mode B02-11 AC/N Internet Channel HT Mode 20MHz Internet Manager Channel HT Mode Configuration It Rate Configuration Internet Manager Client Limits Internet Multicast to Unicast Stream Conversion Enable Disable AP Detection Scan Disable MUSS Link Settings - 5GHz WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None AES Passphrase 12245678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode Internet Intel Pasable Image: Image: Image: Image:	6	Operation Mode			WDS Br	idae 🔻 🗏 Green	0	
and ne Channel HT Mode 20MHz Channel HT Mode 20MHz Channel HT Mode Configuration Transmit Power 11 dBm Bit Rate Configuration e Client Limits Multicast to Unicast Stream Conversion E Enable AP Detection Scan Distable 0 (0miles) WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode ::::::::::::::::::::::::::::::::::::	ment	Wiralage Moda			802.117		-	
re Channel ZUMPZ channel Configuration Transmit Power 11 dBm Bit Rate Configuration Client Limits Image: Client Limits Multicast to Unicast Stream Conversion Enable Obstable AP Detection Distance (0-30km) 0 WDS Link Settings - 5GHz Security None AES Passphrase (6-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode Image: Ima	1	Ohennel UT Made			002.117	-		
Juler Channel Configuration Transmit Power 11 dBm Image: Configuration Bit Rate Configuration Configuration Client Limits Enable © Disable Disable Multicast to Unicast Stream Conversion Enable © Disable AP Detection Distance (0-30km) 0 (Omiles) WDS Link Settings - 5GHz Security None AES Passphrase 12245678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode Image: Security is a set in the channel on both frequency bands manually for settings to take effect.		Channel HT Mode			ZUMHZ	•		
Transmit Power 11 dBm Bit Rate Configuration Client Limits 127 Multicast to Unicast Stream Conversion Enable © Disable AP Detection Scan Distance (0-30km) 0 (0miles)	luler	Channel			Configu	ration		
Bit Rate Configuration Client Limits 127 Multicast to Unicast Stream Conversion Enable © Disable AP Detection Scan Distance (0-30km) 0 WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode I : : : : : : : : : : : : : : : : : : :	nager	Transmit Power			11 dBm	•		
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Under Lethils 127 Multicast to Unicast Stream Conversion Enable Image: Conversion AP Detection Scan Distance (0-30km) 0 WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode : : : : : : : : : : : : : : : : : : :		Client Limite			Enable	e 🔍 Disable		
Multicast to Unicast Stream Conversion Enable Disable AP Detection Scan Distance (0-30km) 0 WDS Link Settings - 5GHz WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode : : : : : : : : : : : : : : : : : : :		Cilence miles			127			
AP Detection Scan Distance (0-30km) 0 (0miles) WDS Link Settings - 5GHz Security None Security None AES Passphrase 12345678 (6-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. Mode Image: Security in the set of t		Multicast to Unicast S	Stream Convers	ion	Enable	e 🔮 🔍 Disable 🔮		
Distance (0-30km) 0 (0miles) WDS Link Settings - 5GHz Security None AES Passphrase 12345678 (8-63 ASCII characters or 64 hexadecimal digits) Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address MACe Enable Enable Disable MACe		AP Detection			Scan			
WDS Link Settings - 5GHz Security None AES Passphrase 12345676 (8-63 ASCII characters or 64 hexadecimal digits) Ceution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address MAC Address Mode : : : : : : : : : : : : : : : : : : :		Distance (0-30km)			0	(Omiles)		
Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect. MAC Address Mode : : : : : : : :		AES Dagenbrage		12345678				
Image: Im								
: : : Disable		Caution: NAWDS is e MAC Address	enabled, please	assign the Chan	nel on both freque	ncy bands manually for s Mode	ettings to take effe	ct.
		Caution: NAWDS is a MAC Address	nabled, please	assign the Chan	el on both freque	ncy bands manually for s Mode Enabl	ettings to take effe e	ct. ▼
: : : : Disable		Caution: NAWDS is e MAC Address	: : : :	assign the Chan	el on both freque	ncy bands manually for s Mode Enabl Disabl	ettings to take effe e	ct.
Dirable T		Caution: NAWDS is e MAC Address	: : : :	assign the Chan	el on both freque	ncy bands manually for s Mode Enabl Disabl Disabl	ettings to take effe e le	cL ▼ ▼
		Caution: NAWDS is e MAC Address	enabled, please	assign the Chan	el on both freque	ncy bands manually for s Mode Enabl Disabl Disabl	ettings to take effe e le le	Ct.
Disable T		Caution: NAWDS is e MAC Address	enabled, please :	assign the Chan	el on both freque	ncy bands manually for s Mode Disabl Disabl	ettings to take effe e le le	ct.
: : : Disable		Caution: NAWDS is e MAC Address	enabled, please	assign the Channel :	el on both freque	ncy bands manually for s Mode Enable Disable Disable Disable Disable	ettings to take effe e le le	ct.
: : : : Disable		Caution: NAWDS is e MAC Address	anabled, please	assign the Channel	el on both freque	ncy bands manually for s Mode Enable Disable Disable Disable Disable Disable Disable Disable	ettings to take effe e le le le le le	ct.
No. 1		Caution: NAWDS is e MAC Address	anabled, please	assign the Chan	el on both freque	ncy bands manually for s Mode Enable Disable Disable Disable Disable Disable Disable Disable Disable Disable Disable Disable	ettings to take effe e le le le le le	ct.
Disable		Caution: NAWDS is e MAC Address	anabled, please	assign the Chan	el on both freque	ncy bands manually for s Mode Enable Disable D	ettings to take effe	ct.
		Caution: NAWDS is e MAC Address : : : : : : : : : : : : : : : : : : :	anabled, please a b a a b b b a b	assign the Chan : : : : : : : : : : : : : : : : : : :	el on both freque	ncy bands manually for s Mode Disabl Disabl Disabl Disabl Disabl Disabl Disabl Disabl Disabl	ettings to take effe e ie ie ie ie ie ie ie	cL T T T T T T T T
RSSI Threshold 0 5GHz		Caution: NAWDS is of MAC Address	anabled, please a b	assign the Channel and a second secon	el on both freque	ncy bands manually for s Mode Enabl Disabl Disabl Disabl Disabl Disabl Disabl Disabl	ettings to take effe	ct.
RSSI Threshold 5GHz Status Enable Disable		Caution: NAWDS is of MAC Address	anabled, please a b	assign the Chan	el on both freque	ncy bands manually for s Mode Enable Disabl Disabl Disabl Disabl Disabl Disabl Disabl Disabl	ettings to take effe	ct.
RSSI Threshold@ 5GHz Status © Enable ® Disable RSSI (Barger, 40x4Bm) @Barger, 40x4Bm) @B		Caution: NAWDS is e MAC Address	enabled, please	assign the Chan	i i i	ncy bands manually for s Mode Enable Disabl Disabl Disabl Disabl Disabl Disabl Disabl	ettings to take effe	ct.
RSSI Threshold 5GHz Status CEnable Disable		Caution: NAWDS is e MAC Address	anabled, please :	assign the Chan	el on both freque	ncy bands manually for s Mode Enable Disabl Disabl Disabl Disabl Disabl Disabl	ettings to take effe	

Figure 19: Save Button

Setup of HWv2

The first configuration you want to change in HWv2 is turning off the management radio while configuring the device via Ethernet cable.

Note: The management radio is used in conjunction with the EnWiFi App. The WDS Bridge mode is not an available operation in the EnWiFi APP.

After login into the unit Click Wireless under the Network tab on the left hand side of the screen. Scroll down and disable the Management Interface radio

< Network			
Basic			
Wireless			
Management	Interface -	2.4G0	
Enabled SSID		Edit	Security
ENMG	MT79C366	Edit	WPA2/PSK AES
Always on •	Turn off if i	dle in 15	minutes

Figure 20: Management Radio enabled

The box should be unchecked.

Management Interface - 2.4G🥑							
Enabled	SSID	Edit	Security				
	ENMGMT79C366	Edit	WPA2/PSK AES				
Always on I Turn off if idle in 15 minutes							

Figure 21: Management Radio Disabled

After unchecking the management interface radio click the save button at the bottom of the Wireless Settings page.

nGeniius®					English	
NS500-AC	Single Radio I	1anagement AP, 2T2R, 8	67Mbps	Changes: 5	Reset	Logout
)verView	Wireless Sett	ings				
Device Status	Device Name	ENS500-AC				
Connections	Country / Regio	USA USA	Ŧ			
Realtime						
letwork						
Basic	EnJet	🖉 Eachla 🔍 Diae	bla			
Wireless	Status	Enable Ulisa	ole			
lanagement						
Advanced			50	Hz (A/N/AC)		
lime Zone	Operation Mod	e	A	ccess Point 🔹 🗷 Gree	en 🤨	
	Channel HT M	ode	40	MHz 🔹		
vstem Manager	Changel			See Forward and		
Account	Channel		C	ontiguration		
Firmware	Transmit Powe	r	A	uto 🔻		
Log	Bit Rate		C	Configuration		
	Client Limits			Enable Disable		
			12	27		
	AP Detection		2	can		
	Distance (0-30	km)	1	(0.6miles)		
	AP Time Slot		A	uto 🔻		
	Station Priority	0	н	igh 🔻		
	Wireless Sett	ings - Access Point				
	Enabled	SSID	Edit	Security VLA	AN ID	
	8	EnGenius79C366	Edit	None -		
	Management	Interface - 2.4G0				
	Enabled	SSID	Edit	Security		
		ENMGMT79C366	Edit	WPA2/PSK AES		
	Always on [®]	Turn off if idle in 15 minutes				
	Management	VLAN Settings	4004			
	Status	Enable Disable Dis	e during the confi	ourstion process, verify that	the switch and the DH	CP.
	server can sup	port the new VLAN ID and then	connect to the new	w IP address.	are switch and the DH	U1.

Figure 22: Save Button

You might get a box warning you to change the management password from default. At this time click the Ignore button, the password will be changed after the device is confirmed to have a WDS Link with the remote unit.



We strongly recommend you to change default password of Management SSID, please reset to login.

Confir	med	
	Apply	Ignore

Figure 23: Management Radio password change warning

A second Box may pop up after pressing the Ignore button. Press Skip on this warning box to proceed to disable the management radio.

We sti chang Mana <u>c</u> reset	rongly su e defaul gement S to login.	ugge t pa SSII	est yo sswor), plea	u to d of ase
	Back		Skip	

Figure 24: Second Warning Box

The next step is to change the mode of operation to WDS Bridge mode. This is done by first disabling EnJet. Once EnJet is disabled the option of WDS Bridge will appear in the drop down menu of operating modes.



< Network	_
Basic	
Wireless	
EnJet🥑	
Status 🔍 Enab	le 🖲 Disable 1

5GHz (A/N/AC)

Operation Mode	WDS Access Poin •	Green 🥑
Channel HT Mode	Access Point Client Bridge	
Channel	WDS Access Point WDS Station	
Transmit Power	WDS Bridge	

Figure 25: Setting WDS Bridge Mode

Don't forget to disable Green mode as well.

After changing the mode of operation to WDS Bridge mode and disabling Green mode, then click the Save button at the bottom of the Wireless Settings page. The unit should reboot.

IS500-AC	Single Radio I	Management AP, 2T2R, 8	67Mbps	Chang	es: 0	Reset	Logou
verView	Wireless Sett	ings					
Device Status	Device Name	ENS500-AC					
Connections	Country / Regi	on USA	•				
Realtime							
etwork							
Basic	EnJet	e Fachia e Bia	bl-				
Vireless	Status	Enable O Disa	IDIE				
anagement							
dvanced			Ę	5GHz (A/N/AC)			
ViFi Scheduler	Operation Mod	e		WDS Access Poi 🔻	🗉 Green 🥑		
ools	Channel HT M	ode		20MHz 🔻			
stem Manager	Channel			Configuration			
ccount							
irmware	Transmit Powe	F		8 dBm •			
.og	Bit Rate			Configuration			
	Client Limits		0	Enable Disable			
				12/			
	AP Detection			Scan			
	Distance (0-30	km)		0 (Omiles)			
	AP Time Slot)		Auto 🔻			
	Station Priority	0		High 🔻			
	Wireless Sett	ingo Assoc Doint					
	Enabled	SSID	Edit	Security	VLAN ID		
	×	Root-AP	Edit	None			
	Management	Interface - 2.4G0					
	Enabled	SSID	Edit	Security			
		ENMGMT79C366	Edit	AES			
	Always on it	Turn off if idle in 15 minutes					
	- Aways off	a rearrow in total in to minutes					
	Management	VLAN Settings	_				
	Status	Enable I Disable	e 4094				
				figuration process, yer	ity that the awi	tch and the DH(P
	Caution: If y server can sup	ou encounter disconnection iss port the new VLAN ID and ther	ue during the cor I connect to the n	ew IP address.	ny that the swi	ten and the brie	

Figure 26: Save button at bottom of Wireless Settings Page

The 5GHz BSSID of HWv2 should be noted. This 5GHZ BSSID should be configured in the remote unit.

 OverView 	
Device Status	
Connections	
Realtime	

Device Information

Device Name	ENS500-AC
Serial Number	19000000
MAC Address	
- LAN	88:DC:96:00:00:C4
- Wireless LAN - 5GHz	88:DC:96:00:00:00
Country	USA
Current Local Time	Fri May 3 11:24:08 2019
Uptime	23h 5m 8s
Firmware Version	v3.5.5_c1.9.20
Hardware Version	2.0
Management VLAN ID	Untagged
Registration Check Code	fffffff

Figure 27: HWv2 5GHz BSSID

The 5GHZ BSSID of the remote unit should be configured into the HWv2 unit. If using encryption enable that option as well as enter the AES Passphrase that matches the HWv1 AES Passphrase.

< Network	
Basic	
Wireless	
WDS Link Settings - 5GHz	
Security	AES

Caution: NAWDS is enabled, please assign the Channel on both frequency bands manually for settings to take effect.

MAC Address					Mode		
88	: DC	: 96	: 11	: 11	: 11	Enable	
	:	:	:	:	:	Disable	
	:	:	:	:	:	Disable	•
	:	:	:	:	:	Disable	•
	:	:	:	:	:	Disable	•
	:	:	:	:	:	Disable	T
	:	:	:	:	:	Disable	•
	:	:	:	:	:	Disable	T

Figure 28: Entering HWv1 5GHz BSSID

After configuring the 5GHz BSSID and the passphrase, then click the Save button at the bottom of the Wireless Settings page. After clicking the Save button at the bottom of the page click either Changes in the upper right hand corner or Apply in the lower right hand corner of the screen. Please refer back to figure 5 on page 4.

Below are best practices for HWv2 in WDS Bridge mode.

< Network	-	
Basic		
Wireless		
	5GHz (A/N/AC)	
Operation Mode	WDS Bridge	🔹 🔲 Green 🥑
Channel HT Mode	20MHz	¥
Channel	Configuration	
Transmit Power	11 dBm	T
Bit Rate	Configuration	
Client Limits	Enable D	isable
AP Detection	Scan	
Distance (0-30km)	(Omiles))
AP Time Slot	Auto	
Station Priority	High	v

Figure 29: HWv2 WDS Bridge Best Practices

Note: *HWv2* is capable of 8 dBm as the lowest *Tx* output setting. When configuring *HWv2* to operate with any *EnGEnius* non *EnJet* capable devices it is recommend that the *Tx* power be set to 11 dBm, which is the lowest *Tx* output power that non *Enjet* products can be configured for.

Configure the channel in the same fashion as shown in HWv1.

24 | Page EnGenius Note: A scan of the wireless environment is not shown as the channel was already set. Please see pages 12-13 for more information on channel scan.

5GHz (A/N/AC)							
Operation Mode	WDS Br	ridge	•		Green 🥑		
Channel HT Mode	20MHz		•				
Channel	Configu	uration					
Transmit Power	11 dBm		•				
Bit Rate	Configu	uration					
Client Limits	Enab 127	le 🔍 Di	sab	le			
AP Detection	Scan						
Distance (0-30km)	0	(Omiles)					
AP Time Slot	Auto		٣				
Station Priority	High		Ŧ				

Figure 30: Channel Config

5GHz



Figure 31: setting Operational Channel

Press save at the bottom of the Wireless Settings page. Please refer to page 4-5 for complete instructions on this step.

UUEAT-AC	Outdoor AP, 2T2	2R, 867M	bps				Chang	es: O	Reset	Lo
rView	Wireless Setting	JS								
vice Status	Device Name	HV	Wv1							
nnections	Country / Region	US	SA		•					
altime										
sie						5GHz				
eless	Operation Mode					WDS Bridge	T	🗉 Green 🕖		
agement	Wireless Mode					802.11 AC/N	V			
vanced	Channel HT Mode					20MHz	Ŧ			
ie Zone	Channel	-				Contracto	_			
ils	Channel					Comgurau	m			
tem Manager	Transmit Power					11 dBm	•			
ount	Bit Rate					Configuratio	m			
mware	Client Limits					Enable 0 107	Disable			
)	Multicast to Unica	st Stream C	Conversio	0		Epable O	0 Diceb	h ()		
	AP Detection	ar carcarri c	2011101010			Scan	- Grand			
	Distance (0-30km	1				0 (07	vilor)			
	AEC Deservices			12345678						
	Caution: NAWDS MAC Address	is enabled,	please a	ssign the Ch	annel on	both frequency	bands ma	nually for set	tings to take ef	fect.
								Fashle		-
	:	:	:	:	:			Enable		¥
	:	:	:	:	:			Enable		* *
			:	:	:			Enable Disable Disable		•
					:			Enable Disable Disable		• •
								Enable Disable Disable Disable		* * *
								Enable Disable Disable Disable		* * *
								Disable		* * * *
								Enable Enable Disable Disable Disable Disable Disable Disable Disable		* * * *
								Enable Disable Disable Disable Disable Disable Disable Disable		T T T T T
								Enable Disable Disable Disable Disable Disable Disable Disable		T T T T T
								Enable Disable Disable Disable Disable Disable Disable		T T T T
	RSSI Threshold					50	энz	Enable Disable Disable Disable Disable Disable Disable		T T T T
	RSSI Threshold					50	Hz Enable ®	Enable Disable Disable Disable Disable Disable Disable		T T T T
	RSSI Threshold Status RSSI (Range: -100dBm	60dBm)				50	Hz Enable ® 5 dB	Enable Disable Disable Disable Disable Disable Disable m		T T T T
	RSSI Threshold Status RSSI Charles and Status	:	: : : : : : : : : : : : : : : : : : :	fisassociater		50 clients that fall nded to disable	Hz Enable = 5 dB below the this feature	Enable Disable Disable Disable Disable Disable Disable m configured R configured R	ISSI threshold i deem it absole	T T T T T T T
	RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic cause wireless cli necessary.		rreshold free	fisassociater quently. It is	vireless	50 clients that fall nded to disable	Hz Enable = 5 dB below the this feature	Indue Enable Disable Disable Disable Disable Disable Disable Disable m configured R	ISSI threshold i deem it absol	T T T T T T T
	RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic cause wireless cli necessary.		:	fisassociater quently. It is	vireles	50 clients that fall nded to disable	Hz Enable = 5 dB below the this feature	Indue I	ISSI threshold i deem it absol	T T T T T T T
	RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic cause wireless cli necessary.		rreshold free	fisassociater quently. It is	vireless	50 clients that fall nded to disable	Hz Enable = 5 dB below the this feature	Indue	ISSI threshold i deem it absol	T T T T T T T
	RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic Caution: Enablic cause wireless cli necessary.	C C C C C C C C C C C C C C C C C C C	rreshold free	fisassociater quently. It is	v wireless	50 clients that fall nded to disable	Hz Enable = 5 dB below the this feature	Indue	tSSI threshold i	T T T T T T T
	RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic cause wireless cli necessary.	C C C C C C C C C C C C C C C C C C C	rreshold free	fisassociater quently. It is	v wireless	50 clients that fall nded to disable	Hz Enable = 5 dB below the this featu	Indue Enable Disable Disable Disable Disable Disable Disable Disable Disable m configured R e unless you	tSSI threshold i	T T T T T T T T T
	RSSI Threshold Status RSSI Threshold Status RSSI (Range: -100dBm Caution: Enablic cause wireless cli necessary.	Contraction Contr	rreshold in a second se	fisassociater quently. It is Disable 40	vireless vireless	clients that fall nded to disable	Hz Enable = 5 dB below the this featur	Indue	tSSI threshold deem it absolution vitch and the D	T T T T T T T T T T T T T T T T T T T

Figure 32: Save button

Once the WDS Link is established you can check on the signal strength if the link to determine if the units TX power needs to be adjusted or the antennas need to be aligned better. Below is where to find the RSSI of the WDS link in HWv1.



WDS Link Lis	st - 5GHz		
WDS Link ID#	MAC Address	Link Status	RSSI(dBm)
#1	88:dc:96:11:11:11	UP	-53
Refresh			

Figure 34: HWv2 RSSI

The RSSI value you should be aiming for is between -65dBm to -40 dBm. Any signal worse than -65 dBm, and you will not get steady high data rates. If you get too much signal (-35 dBm) then that will start to self-interfere and it will degrade the signal. For any deployments less than 50 feet we recommend starting both units at the lowest transmit power settings and if need be move up from there. If you are still getting too strong of a signal at very close ranges then purposely misaligning the radios by connecting to the side lobes may be necessary.