AUTBUS Configuration Tool Operation Manual

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1 Introduction

AUTBUS configuration tool is used to configure AUTBUS network transmissions based on AUTBUS protocol converters and I/O connectors. AUTBUS is a new type of timesensitive broadband industrial Internet of Technology featuring multi-nodes, high bandwidth and long-distance transmission. The AUTBUS network consists of a Management Node (MN) and multiple Terminal Nodes (TN), and MN and TN is connected via a differential pair. TN can directly communicate with MN and TN. MN is responsible for control over the entire network, including network configuration and initialization and physical layer channel scheduling and communication with the outer network.

AUTBUS adopts Orthogonal Frequency Division Multiplexing (OFDM) as the physical layer technology. During the transmission process, data streams are converted into OFDM symbols after being scrambled, coded and modulated with Quardrature Amplitude Modulation (QAM), and then composed into frames and transmitted based on different transmission modes. The receiving process is the opposite.

This manual introduces the configuration of the AUTBUS network using the configuration tool. The configuration tool is applicable for administrators that have a basic understanding of the AUTBUS network and can manually configure the AUTBUS network parameters based on actual needs. The protocol converters also support a rotary DIP switch to enable the AUTBUS network to function automatically based on the configuration of the rotary DIP switch.

1



2 How to Use

2.1 Connect Devices

The steps for connecting AUTBUS devices are as follows:

- 1 Connect AUTBUS devices with AUTBUS cables to form a bus-type or ring-type network;
- 2 Connect the PC on which the configuration is installed with an AUTBUS device that has an Ethernet interface (AUTBUS to Ethernet protocol converter).
- 3 Power on all devices.

The following figure shows an example of bus-type AUTBUS network.



Figure 1 Bus-type AUTBUS Network



2.2 Access the Configuration Tool

2.2.1 Login

After cables are properly connected to form a network, you can access the configuration tool via the following steps:

1 Double-click the configuration tool program, such as "AUTBUS Tools v3.0.2.exe". The login page is displayed, as shown below. Enter the default username and password "admin" or other username or password, and then click <Login>.

AUTBUS Tools V3	.0.2	_	×
	admin)	
	•••••)	
	Login		

Figure 2 Login Page

2 The home page is displayed, as shown below.



I AUTBUS T	Fools V3.0.2							- 🗆 X	
NIC IP:	10.10.8.32	Status: E	Error	🖋 Bind			MAC: 🗌	11:22:33:44:55:66	
NIC Sele:	以太网		~	🕏 Refresh	Username:	admin1	admin 上 User	r Manage 🛛 🏟 Log Out	
Autbus Network Node Configuration Resource Configuration									
	🔹 View Conf	iguration			Change Configuration		MN Dial Code: 0		
Tx-Mode:	0 🗸	Mumb:	0	Bandwidth:15	.744 Mbps Tx-Gair	n: -4 dB 🗸			
Pwr-Ratio:	0 🗸	Mdmb:	0	Bandwidth:15	.744 Mbps SideBa	nd: FULL 🗸 🗸			
Musslar Mul	Itinla Unnar Madu	lation Band	Mdmbu	Jultiple Down Me	dulation Rand				
PICITID: MU	inple opper Mouu	acion banu	MUTTER	narchie Dowit Mo	uulacioli Dallu				
Tx-Mode:	The transmission	mode can be	selected fr	om four values: 0	, 1, 2, and 3. The larger	the number of th	ne transmission mode	e, the longer the subcarrier	
spacing, the the shorter	e snorter the symi the subcarrier spa	acing, the lor	ngtn), and 1der the svi	the faster the rea mbol (frame lengt	i-time response, making (h) and the cyclic prefix	'CP) length (time-	ort-distance real-tim -division duard interv	e control scenarios. Conversely, val), resulting in a theoretically	
longer trans	smission distance.	Generally, f	or long-dist	ance transmission	ns, transmission mode 0	is selected	5	,	
Transmiss	ion Mode			0	1	2	3		
Frame Len	ath(64 OFDM sv	/mbols)		4 ms	2 ms	1 ms	0.5 ms		
OFDM Syn	bol Length TSY	M		62.5 us	31.25 us	15.625 us	7.8125 us		
Frames Pe	r Second			250	500	1000	2000		
Sideband I	Modulation Codi	ng Mode: T	here are found	ir options for the	Sideband Modulation Co	ding Mode: 0, 1,	2, and 3, each corre	sponding to four different	
modulation	methods and cod	ing rate mod	buing mode les are desc	ribed as follows:	termines the ellective p	rtes carried by a s	symbol. The demodu	lation thresholds for different	
modulation	meenous and cou	ing race moa	ies are dese						
Sideband I	Modulation Codi	ng Mode		0	1	2	3		
Modulatio	n Mode			16 QAM	64 QAM	64 QAM	256 QAM		
Code Rate				1/2 CC Rate	1/2 CC Rate	2/3 CC Rate	3/4 CC Rate		
Demodula Ratio(DB)	tion Threshold S	Signal-to-N	oise	16	21	26	30		

Figure 3 Home Page

- 3 Click the <Refresh> button.
- 4 Select the NIC from the "NIC Sele" dropdown list and confirm the NIC IP address to be bound.
- 5 Click the <Bind> button.
- 6 View the network status. The NIC is successfully bound if the status is "Normal", as shown in Figure 4. If not, a prompt displaying "Failed to read configuration" is displayed. When a binding failure occurs, unbind the NIC and then rebind it. If the problem persists, check whether the device is properly connected and the selected NIC is correct.

2.2.2 Home Page

If the NIC is successfully bound, the main page is displayed as shown below.



NIC IP	192 168 0 1	12 St	atus: N	ormal	🖉 Unbundle			MAC	11:22:33:44:	55:66
	102.100.0.1			onnai				1.110		00.00
NIC Sele:	以太网 3			~	🛸 Refresh	Usernam	e: admin1	admin 👤	User Manage	🕼 Log Ou
Authus N	etwork	Node Confi	iguration	Reso	urce Configuration					
nucleus n		Node com	garación	Rest	aree configuration					
	🔹 View	Configura	tion			Change Configuration	n	MN Dial Code:	68	
	-	5								
Tx-Mode:	0	<u>~</u> м	umb: 1		 Bandwidth:25. 	984 Mbps Tx-G	in: 0 dB	~		
			C							
Pwr-Ratio	0						and: EUL			
	0	✓ M	dmb: 1		 Bandwidth:25. 	984 MDps Side	anu. FULL	×		
1umb: Mult x-Mode: T pacing, the	tiple Upper The transmis	Modulation ssion mode	idmb: 1 n Band e can be rame ler	Mdmb selected gth), an	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real	Julation Band 1, 2, and 3. The larg -time response, maki	er the number of	the transmission short-distance real	mode, the longer -time control sce	the subcarrie
lumb: Mult x-Mode: T pacing, the onversely, t neoretically	tiple Upper The transmis shorter the the shorter longer tran	Modulation ssion mode symbol (fi the subcar ismission d	a Band e can be rame ler rier spac listance.	Mdmb selected gth), an ing, the Generall	Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance	Julation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is	the transmission short-distance real) length (time-div selected	mode, the longer -time control sce ision guard interv	the subcarrie narios. val), resulting
fumb: Mult x-Mode: T pacing, the conversely, t heoretically rransmission	tiple Upper The transmis shorter the the shorter longer tran on Mode	Modulation ssion mode e symbol (fi the subcar ismission d	dmb: 1 Band can be rame ler rier spac listance.	Mdmb selected gth), an cing, the Generall	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0	Julation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is	the transmission short-distance real) length (time-div selected 3	mode, the longer -time control sce ision guard interv	the subcarrie narios. val), resulting
4umb: Mult [x-Mode: T pacing, the conversely, t heoretically [ransmissid ranne Leng	tiple Upper The transmis shorter the the shorter longer tran on Mode gth(64 OFI	Modulation ssion mode symbol (fi the subcar smission d	dmb: Band can be rame ler rier spac listance.	Mdmb selected gth), an ing, the Generall	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0 4 ms	Julation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm 1 2 ms	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is 2 1 ms	the transmission short-distance real) length (time-div selected 3 0.5 ms	mode, the longer -time control sce ision guard interv	the subcarrie narios. ral), resulting
lumb: Mult x-Mode: T pacing, the onversely, t heoretically ransmission rame Leng DFDM Symi	tiple Upper The transmis shorter the the shorter longer trar on Mode gth(64 OFI bol Length	Modulation ssion mode e symbol (fi the subcar smission d	dmb: 1 Band can be rame ler rier spac listance.	Mdmb selected gth), an ing, the Generall	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0 4 ms 62.5 us	lulation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm 1 2 ms 31.25 us	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is 2 1 ms 15.625 us	the transmission short-distance real) length (time-div selected 3 0.5 ms 7.8125 us	mode, the longer -time control sce ision guard interv	the subcarrie narios. ral), resulting
Mumb: Mult fx-Mode: T pacing, the conversely, the con	tiple Upper The transmis shorter the the shorter longer trar on Mode gth(64 OFI bol Lengtt or Second	Modulation ssion mode symbol (fi the subcar ismission d DM symbo	dmb: 1 Band can be rame ler rier spar listance.	Mdmb selected gth), an ing, the Generall	Bandwidth:25. Multiple Down Mod from four values: 0, the faster the real longer the symbol (y, for long-distance 0 4 ms 62.5 us 250	lulation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm 1 2 ms 31.25 us 500	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is 2 1 ms 1000	the transmission short-distance real) length (time-div selected 3 0.5 ms 7.8125 us 2000	mode, the longer -time control sce ision guard interv	the subcarr narios. val), resultin
fumb: Mult fx-Mode: T ipacing, the conversely, heoretically fransmissie frame Leng DFDM Symi frames Per Sideband M nodulation c nodulation c	tiple Upper the transmis- shorter the the shorter ionger trar on Mode gth(64 OFI bol Length r Second Modulation codings. On methods an	Modulation ssion mode symbol (fi the subcar smission d DM symbo t TSYM Coding M ce a modul d coding ra	a Band e can be rame ler rrier space listance.	Mdmb selected gth), an ing, the Generall ere are f ding mo ss are de	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0 4 ms 62.5 us 250 Four options for the 8 de is selected, it det scribed as follows:	lulation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm 1 2 ms 31.25 us 500 Sideband Modulation ermines the effective	er the number of ig it suitable for : cyclic prefix (CP ission mode 0 is 2 1 ms 15.625 us 1000 Coding Mode: 0, bytes carried by a	the transmission short-distance real) length (time-div selected 3 0.5 ms 7.8125 us 2000 1, 2, and 3, each of a symbol. The den	mode, the longer -time control sce ision guard interv 	the subcarrie narios. val), resulting four different olds for differ
Aumb: Mult ix-Mode: T pacing, the conversely, the conversely, the rame Leng DFDM Syml Frames Per Sideband M nodulation of nodulation of Sideband M	tiple Upper the transmis- shorter the the shorter longer tran on Mode gth(64 OFI bol Length r Second Modulation codings. On methods an Modulation	Modulation ssion mode symbol (fi the subcar ismission d DM symbo DM symbo DTSYM Coding M Coding M Coding M	dmb: 1 n Band e can be rame ler rier spac listance. DIS) lode: Th lation co ate mode	Mdmb selected g(h), an ing, the Generall ere are f ding mo es are de	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0 4 ms 62.5 us 250 Four options for the S de is selected, it det scribed as follows: 0 4 o the set of t	Iulation Band 1, 2, and 3. The larg -time response, maki frame length) and th transmissions, transm 1 2 ms 31.25 us 500 Sideband Modulation ermines the effective	er the number of ig it suitable for : e cyclic prefix (CP ission mode 0 is 2 1 ms 15.625 us 1000 Coding Mode: 0, bytes carried by : 2 2 2 2 2 2 2 2 2 2 2 2 2	the transmission short-distance real) length (time-div selected 3 0.5 ms 7.8125 us 2000 1, 2, and 3, each d a symbol. The den 3 255 c 0.111	mode, the longer -time control sce ision guard interv 	the subcarrie narios. val), resulting four different olds for differ
Jumb: Mult fx-Mode: T ipacing, the conversely, the conversely, the heoretically Franse Leng DFDM Syml Frames Per Sideband M nodulation of nodulation of Sideband M Audulation Autor Sideband M Audulation Autor Sideband M Autor Sideband M Autor Sideband M Sideband M Sideband Sideband M Sideband M Sideband Sideband M	tiple Upper the transmis- shorter the the shorter longer trar on Mode gth(64 OFI bol Length r Second Modulation codings. On methods an Modulation	Modulation ssion mode e symbol (fi the subcar ismission d DM symbo TSYM Coding M ce a modul d coding ra	dmb: 1 Band can be rame ler riter spac listance. bls lode: Th lation co ate mode lode	Mdmb selected gth), an ing, the Generall ere are t ding mo ss are de	Bandwidth:25. Multiple Down Mod from four values: 0, d the faster the real longer the symbol (y, for long-distance 0 4 ms 62.5 us 250 four options for the S de is selected, it det scribed as follows: 0 16 QAM 1/2 CC Bate	984 MDps Sidet Iulation Band 1, 2, and 3. The larg -time response, maki frame length) and th frame length) and th 1 2 ms 31.25 us 500 500 Sideband Modulation seffective 1 64 QAM 1 2.05 Rate	er the number of ig it suitable for : cyclic prefix (CP lission mode 0 is 2 1 ms 15.625 us 1000 Coding Mode: 0, bytes carried by : 2 64 QAM 2/2 CC Bate	the transmission short-distance real) length (time-div selected 3 0.5 ms 7.8125 us 2000 1, 2, and 3, each of a symbol. The den 3 256 QAM 2/4 CG Pate	mode, the longer -time control sce ision guard interv 	the subcarrie narios. ral), resulting four different iolds for differ

Figure 4 NIC Binding Success

NIC IP

Function: Display the network interface card (NIC) IP address of the PC connected to the configuration tool. With the network cable connected properly, the configuration tool will automatically obtain the NIC IP addresses.

Status

Display options: Normal/Error

Function: Display the communication status. After the NIC are correctly bound to the configuration tool, "Normal" is displayed. Otherwise, "Error" is displayed.

MAC

Configuration options: Selected/Unselected

Default configuration: Unselected

Function: The MAC address can be edited after this option is selected.

Description: The configuration tool uses this MAC address to communicate with the



AUTBUS network. It is not recommended to modify the MAC address. Otherwise, a network disconnection might occur.

NIC Sele

Function: Select the NIC of the connected PC.

Bind/Unbundle

Function: Click this button to bind or unbind the NIC.

Refresh

Function: Click this button to refresh the NIC list.

Username

Function: Display the alias name and actual username of the currently login user.

User Manage

Function: Click this button to open the user configuration page.

Log Out

Function: Click this button to log out the currently login user.

AUTBUS Network

Function: Configure the AUTBUS network on this tab. For details, refer to "2.4 Configure

AUTBUS Network".

Description: This tab displays AUTBUS network information saved on MN. If no MN exists in the network, this tab displays AUTBUS network information saved on the local device that is directly connected to the configuration tool. In this case, the configuration tool cannot obtain node and resource configurations in the network.

Node Configuration

Function: Configure AUTBUS nodes on this tab. For details, refer to "2.5 Configure Nodes".

Resource Configuration

Function: Configure resource blocks allocated to the AUTBUS network on this tab. For details, refer to "2.6 Configure Resources".



2.3 User Management

To prohibit illegal users' access, the configurations tool supports user management. Only one administrator account is supported, that is, the "admin" account, which can manage ordinary users. Ordinary users can only configure their own alias names and passwords.

2.3.1 Configure User Information

After login with the default user "admin", click <User Manage> to open the "User Manage" dialog box, as shown below.

User Manage					X
User List:	Basic Info	Add User			-
admin1	Dusic Into	Add 03cl			
zhaona	Username:	zhaona			
	Name:	zhaona			
	Password:				
		🖉 Alter	🖉 Delete		
					Ţ

Figure 5 Change User Configuration

On the [Basic Info] tab, the login user can configure the currently login user, including the alias name and password. The "admin" user can delete an ordinary user.



Note:

The "admin" user cannot be deleted.

Username

Function: Display the username.

Name



Configuration range: 3~10 characters

Function: Configure the alias name of a user.

Password

Configuration range: 3~10 characters

Function: Configure the user's password.

2.3.2 Create Ordinary Users

On the [Add User] tab, the "admin" user can create ordinary users.

User Manage		ſ
User List:	Basic Info	
admin1		
	Username:	
	Name:	
	Password:	
	Add	

Figure 6 Create Ordinary User

Username

Configuration range: 3~10 characters

Function: Configure the username.

Name

Configuration range: 3~10 characters

Function: Configure the alias name of the user.

Password

Configuration range: 3~10 characters

Function: Configure the user's password.



2.4 Configure AUTBUS Network

2.4.1 Configuration via Rotary DIP Switch

There is a rotary DIP switch on the front panel of the device, which supports 16 dial codes (0~F), and the default dial code is 0. The rotary DIP switch makes the configuration of AUTBUS network parameters more conveniently. It supports two configuration modes:

- Automatic Configuration: Dial codes 0~7, except 2, adopt automatic configuration. Each dial code has been inbuilt with fixed configurations of the role, AUTBUS parameter and resources. With the DIP switch pointing to a specific dial code, the corresponding configurations are delivered and transparent data transmissions are implemented in the AUTBUS network. This mode is easy to use and can satisfy varied application requirements.
- Manual Configuration: Dial codes 8~F support manual configuration. You can customize AUTBUS work mode configurations as needed and save the configurations to the dial codes. This mode requires that the user has a deep knowledge of AUTBUS protocol.



Note:

- The AUTBUS configurations applied after the rotary DIP switch is set on MN can be viewed on the configuration tool.
- If the rotary DIP switch is reconfigured, the new configurations take effect only after the device is restarted.

In the AUTBUS network, you should configure one device to act as Management Node (MN). MN is the management mode in the AUTBUS network. It is responsible for Terminal Node (TN) management, resource configuration, etc. Only one MN can exist in the AUTBUS network. To configure a device to act as MN, you should configure the rotary DIP switch on this device to point to dial code 4/5/6/7/8/9/A/B/C/D/E/F. To configure a device to



act as TNs, you should configure the rotary DIP switch to point to dial code 0/1/3/F. The dial code configurations on the devices in the AUTBUS network need to match the mapping relationships as shown in the following table.

Туре	TN	MN
Mapping 1	0/1	4~7
Mapping 2	3	8~E
Mapping 3	F	F

Table 1 Dial Code Mapping Relationships



Figure 7 Dial Code Configuration

• Mode 0 and 1

When the rotary switch points to dial code 0 or 1, the device role is TN. TNs configured at mode 0 or 1 can only work with the MN configured at mode 4, 5, 6 or 7 and connected on the same bus line.

Mode 0 and 1 have been inbuilt with fixed bandwidth configurations for different types of protocol converters and the configurations cannot be modified. Other configurations, including the sideband mode, transmission mode, transmission gain, etc, are synchronized from the MN. For details about the bandwidth configurations, see the following table.

Converter Ture	Bandwidth De	finition (Mbps)
Converter Type	Mode 0	Mode 1
AUTBUS to RS485	0.75	1.5
AUTBUS to CAN	0.75	1.5



• Mode 2

This mode is reserved and not supported currently.

• Mode 3

When the rotary DIP switch points to dial code 3, the device role is TN. TNs configured at mode 3 can only work with the MN configured at mode 8, 9, A, B, C, D or E and connected on the same bus line. Similar to mode 0 and 1, TNs configured at mode 3 also synchronize the sideband mode, transmission mode, transmission gain configurations, etc. from the MN. The difference is that this mode allows the user to define the bandwidth of TN. By default, the bandwidth is configured to 0 Mbps.

• Mode 4

When the rotary DIP switch points to dial code 4, the device role is MN. Mode 4 is applicable to short-distance transmission scenarios (within 100 m). This mode features high bandwidth and real-time capabilities. The AUTBUS parameter configurations are fixed and cannot be modified.

Table 3 AUTBUS Parameter Configurations of Mode 4

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	2	3	100 Mbps	1	5	1 ms

• Mode 5

When the rotary DIP switch points to dial code 5, the device role is MN. Mode 5 is applicable to long-distance transmission scenarios (within 500 m) that requires high bandwidth. This mode features better anti-interference capabilities than mode 4. The AUTBUS parameter configurations are fixed and cannot be modified.

 Table 4 AUTBUS Parameter Configurations of Mode 5

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	1	3	100 Mbps	1	5	2 ms



• Mode 6

When the rotary DIP switch points to dial code 6, the device role is MN. Mode 6 is applicable to long-distance transmission scenarios (within 500 m). This mode features better anti-interference and fault-tolerant capabilities than mode 5. The AUTBUS parameter configurations are fixed and cannot be modified.

Table 5 AUTBUS Parameter Configurations of Mode 6

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	1	2	62 Mbps	1	5	2 ms

• Mode 7

When the rotary DIP switch points to dial code 7, the device role is MN. Mode 7 is applicable to environments where there are many interference sources. This mode features better anti-interference capabilities than mode 6 while supporting transmission over long distances (within 500 m). The AUTBUS parameter configurations are fixed and cannot be modified.

Table 6 AUTBUS Parameter Configurations of Mode 7

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	0	0	31 Mbps	1	5	4 ms

Mode 8~E

When the rotary DIP switch points to dial codes 8 to E, the device role is MN. Modes 8 to E have been inbuilt with default AUTBUS parameter configurations. You can use the defaults or redefine them as needed and save the defined configurations to the dial code. Modes 8 to E allow the user to define the bandwidth of TN.

Table 7 AUTBUS Parameter Configurations of Mode 8~E

Sideband	TX Mode	Code Mode	Max Bandwidth	Power Ratio	Tx Gain	Tx Interval
Full	0	0	31 Mbps	0	0	4 ms



Mode F

When the rotary DIP switch points to dial code F, the rotary DIP switch of all devices must point to F; otherwise, communication is not possible. Mode F is the full self-definition mode, without AUTBUS parameters configured, and the device role is TN by default. You need to configure the device role, AUTBUS parameter and resources and save the configurations to dial code F through the AUTBUS configuration tool (upper computer) or console terminal.

2.4.2 Configuration via Configuration Tool

When the rotary DIP switch points to dial codes 8 to F, you can define AUTBUS parameters via the configuration tool based on actual needs. After configurations, you need to click <Change Configuration> to save the configurations and then restart the devices to enable new configurations to take effect.

Autbus N	etwork	Node Con	nfiguratio	Resourc	e Configuration					
	😵 Vie	w Configur	ation			🖉 Change Config	Juration		MN Dial Code: 68	3
Tx-Mode:	0	~	Mumb:	1 ~	Bandwidth:25	.984 Mbps	Tx-Gain:	0 dB 🗸		
Pwr-Ratio:	0	~	Mdmb:	1 ~	Bandwidth:25	.984 Mbps	SideBand:	FULL V		
					-					
Marine Brandaula				M alasha M	ultin la Davia Ma	dulation David				
Mumb: Muit	tiple Uppe	er Modulatio	on Band	Mamp: M	uitipie Down Mo	dulation Band				
Tx-Mode: T spacing, the the shorter t longer trans	he transn shorter t he subcar mission d	nission moo he symbol (rrier spacing istance. Gel	le can be (frame le g, the loi nerally, f	e selected fro ength), and t nger the sym for long-dista	m four values: (he faster the rea Ibol (frame leng nce transmissio), 1, 2, and 3. Th al-time response, th) and the cyclic ns, transmission	e larger the making it s prefix (CP) mode 0 is s	e number of the suitable for sho) length (time- elected	e transmission moo rt-distance real-tin division guard inter	de, the longer the subcarrier ne control scenarios. Conversely, rval), resulting in a theoretically
Transmissi	on Mode				0	1		2	3	
Frame Lend	gth(64 0	FDM symb	ols)		4 ms	2 ms		1 ms	0.5 ms	
OFDM Sym	bol Leng	th TSYM			62.5 us	31.25 u	s :	15.625 us	7.8125 us	
Frames Per	' Second				250	500		1000	2000	
Sideband M modulation of modulation r	lodulatio codings. C methods a	on Coding Once a mod and coding	Mode: T ulation c rate mod	here are four oding mode des are descr	r options for the is selected, it de ibed as follows:	Sideband Modul termines the effe	ation Codin active bytes	g Mode: 0, 1, 2 carried by a sy	2, and 3, each corre ymbol. The demodu	esponding to four different ulation thresholds for different
Sideband M	1odulatio	on Coding	Mode		0	1		2	3	
Modulation	Mode				16 QAM	64 QAN	1	64 QAM	256 QAM	
Code Rate					1/2 CC Rate	1/2 CC R	ate 2,	/3 CC Rate	3/4 CC Rate	
Demodulat Ratio(DB)	ion Thre	shold Sigr	nal-to-N	oise	16	21		26	30	

Figure 8 Configure AUTBUS Network Work Mode

View Configuration

Function: Click this button to refresh AUTBUS network configuration information.

Change Configuration



Function: Click this button to save configurations. AUTBUS network configuration modifications take effect only after the device is rebooted.

MN Dial Code

Function: Display the dial code of the configured rotary DIP switch on MN.

Description: If no MN exists in the network connected to the configuration tool, this element displays the dial code of the local device that is directly connected to the configuration tool. In this case, the configuration cannot obtain the node and resource configurations in the network. When the dial code that the DIP switch points to is changed, you need restart the device and refresh the [AUTBUS Network] tab by clicking <View Configuration>.

Tx Mode

Configuration range: 0~3

Default: 0

Function: Configure the transmission mode.

Description: Transmission mode determines the number of frames transmitted per second and the time needed for transmitting each frame and each OFDM symbol. The larger the value of transmission mode, the longer the subcarrier spacing, the shorter the symbol (frame length) and the faster the real-time response, making it suitable for short-distance real-time control scenarios. Conversely, the shorter the subcarrier spacing, the longer the symbol (frame length) and the cyclic prefix (CP) length (time-division guard interval), resulting in a theoretically longer transmission distance. Generally, for long-distance transmission scenarios, transmission mode 0 is selected.

Detailed descriptions of each transmission mode are shown in the following table.

Take Transmission Mode 0 as an example. When the number of cyclic frames is 1, the transmission interval is 4 ms. When the number of cyclic frames is 2, the transmission interval is 8 ms. For information about how to configure the number of cyclic frames, see the "Interval" parameter in "2.6 Configure Resources".

Table 8 Descriptions of Transmission Mode

14



Transmission Mode	0	1	2	3
Frame Length (64 OFDM symbols)	4 ms	2 ms	1 ms	0.5 ms
OFDM Symbol Length (TSYM)	62.5 us	31.25 us	15.625 us	7.8125 us
Frames per Second	250	500	1000	2000

Pwr-Ratio

Configuration range: 0~3

Default configuration: 0

Function: Configure the power ratio of lower sideband modulation coding mode to upper sideband modulation coding mode when full sideband mode is used. The larger the value of power ratio, the higher the power proportion for the upper sideband and the lower the proportion for the lower sideband. User can adjust the power ratio accordingly based the actual channel quality.

Mumb/Mdmb

Configuration range: 0~3

Default configuration: 0

Function: Configure the Multiple Upper Modulation Band (MUMB) and Multiple Down Modulation Band (MDMB) mode.

Description: The modulation band mode determines the effective bytes carried by a symbol. The modulation mode is QAM.

> 16 QAM: each symbol is represented by 4 bits;

- > 64 QAM: each symbol is represented by 6 bits;
- > 256 QAM: each symbol is represented by 8 bits;

CC (Code Rate) indicates the ratio of useful bits to the totally transmitted bits. The lower the code rate, the larger the number of redundant bits added by the physical layer.

Signal-to-Noise Ratio (SNR) indicates the ratio of useful signals to noise signals. "Demodulation Threshold Signal-to-Noise Ratio" specifies the lower limit of signal-to-noise ratio for received signals. When SNR is lower than the threshold, the received signals might



be disturbed by noises and results in demodulation errors. Generally, a larger threshold indicates that the system has better anti-interference performance, but it affects system complexity and power consumption.

Descriptions of Modulation Modes, Code Rates and Demodulation Threshold Signal-to-Noise Ratio corresponding to the four sideband modulation coding modes are shown in the following table.

Table 9 Descriptions of Upper/Lower Sideband Modulation Coding Mode

Sideband Modulation Coding Mode	0	1	2	3
Modulation Mode	16 QAM	64 QAM	64 qam	256 QAM
Code Rate	1/2 CC Rate	1/2 CC Rate	2/3 CC Rate	3/4 CC Rate
Demodulation Threshold Signal-to-	16	01	26	20
Noise Ratio (DB)	10	21	20	30

Tx-Gain

Configuration range: -4~13 dB

Default configuration: 0

Function: Set the gain for transmitted signals.

Description: The greater the value of transmission gain, the greater the signal strength.

Signals might degrade as they travel over long distances. In such circumstances, it is recommended to set a greater value of transmission gain to increase the signal strength.

Sideband

Configuration options: FULL/HALF

Default configuration: Full

Function: Select the sideband mode.

Description: In half sideband mode, only the lower sideband is transmitted. Therefore, the bandwidth used is only half that in full sideband mode.

The bandwidth definition corresponding to customized AUTBUS parameter definitions



are shown in the following table.

No	Transmission Mode	Coding Mode	Bandwi	dth (Mbps)
NO.		Coding Mode	Full Sideband	Half Sideband
1	0	3	100	50
2	0	2	62	31
3	0	1	51	25.5
4	0	0	31	15.5
5	1	3	100	50
6	1	1	50	25
7	1	0	30	15.5
8	2	3	100	50
9	2	2	60	30
10	3	3	96	48

Table 10 Bandwidth Definition Corresponding to AUTBUS Parameter Definition

Role

Configuration options: MN/TN

Function: Configure the device role.



Note:

For the AUTBUS work mode where the value of "Tx Mode" is 2 and the value of both "Mumb" and "Mdmb" is 3, it is recommended that the total length of the bus line is within 100 m. For other modes, the total length of the bus line should be within 500 m.

2.5 Configure Nodes

The [Node Configuration] tab displays configurations of effective nodes on the AUTBUS network. Nodes can also be configured on this tab.



2.5.1 View Node Configurations

After completing AUTBUS parameter configurations of the AUTBUS network, click the [Node Configuration] tab. This tab displays all nodes that have come online. If any device fails to come online, check whether the device is properly connected and whether the device is restarted after a program update.

A	itbus N	letwork	Node Configu	iration	Resource C	onfiguration							
\$	Refres	n 🖞 Firm	ware Update	🕸 Param	neter Setting	s 🕐 Reboot	👭 Open I	LED	A Close LED				
	Index	Dial Code	Device Name	Device U	ID	Device Addr	Node Type	Role	App Ver	Device State	Bus Listening	Channel Quality	Runtime Duration
	1		сс	EF:40:1	8:49:4F:2A	85	MNSDK	MN	23-12-15,10:34	Configuring	Unmonitored	<u>View</u>	0d 0h 25m 16s
	2		aa	EF:40:1	8:5E:49:29	0	TNSDK	ΤN	23-12-15,10:34	Working	<u>Listen</u>	<u>View</u>	0d 0h 25m 16s
L													

Figure 9 Node Configuration

Refresh

Function: Click this button to refresh the [Node Configuration] tab.

Firmware Update

Function: Click this button to enter the firmware update page. For details, see "2.5.2

Update Firmware".

Parameter Settings

Function: Select a device and then click this button to enter the parameter setting page

of this device. For details, see "2.5.3 Set Device Parameters".

Reboot

Function: Select a device and click this button, then the device will be rebooted.

Open LED

Function: Click this button to light the LED. The LED will lose its fault reporting functionality.

Close LED



Function: Click this button to restore the fault reporting functionality of the LED.

Index

Function: Display the node indexes.

Dial Code

Function: Display the dial code of the rotary DIP switch on the device.

Device Name

Function: Display the device name, which can be configured through the [Parameter

Settings] option.

Device UID

Function: Display the device UID.

Description: Device UID identifies a device. Each device has a unique UID.

Device Addr

Function: Display the device address, which can be configured through the [Parameter

Settings] option.

Node Type

Display options: MNSDK/TNSDK

Function: Display the device type.

Role

Display options: MN/TN

Function: Display the device role.

App Ver

Function: Display the firmware version of the device.

Device State

Display options: Working/Configuring

Function: Display the device status.

- > "Working" indicates that the device is working properly.
- > "Configuring" indicates that the device is the one connecting to the upper computer.

Node ID



Function: Display the node ID.

Bus Listening

Display options: Listen/Unmonitored

Function: Display whether bus listening is enabled on the device. The bus listening feature can be configured through the [Parameter Settings] option. When this feature is enabled, "Listening" is displayed. Click <Listening> to enter the bus listening statistics page. For details, see "2.5.5 Configure Bus Listening".

Lostcnt

Function: Display the number of times that the node has gone offline.

Traffic Statistics

Function: Click <View> in the "Traffic Statistics" column to view traffic statistics. For details, see "2.5.6 View Traffic Statistics".

Channel Quality

Function: Click <View> in the "Channel Quality" column to view channel quality. For details, see "2.5.7 View Channel Quality".

Runtime Duration

Function: Display the elapsed time since the device boots up.



Note:

Right click any place in the table head to select more options of node information to be displayed.

2.5.2 Update Firmware

On the [Node Configuration] tab, select a device and then click <Firmware Update> to update the firmware of the device.

As shown in the following figure, click <Select Firmware>, select the firmware file to be upgraded, and then click <upgrade>. When the progress bar reaches 100%, wait one minute and then restart the device. During the upgrade process, to terminate the upgrade, click



<stop>.

7

∱Firmware Update		
update device list:	app-0.0.1.B4.0.1.B1.0.3.bin	Select Firmware
сс	✓ upgrade ✓ stop 43%	
	Figure 10 Update Firmware	
Warning:		

The firmware file is a binary file named with suffix ".bin". When update is complete, restart the device and then the new version takes effect.

2.5.3 Set Device Parameters

On the [Node Configuration] tab, select a device and click <Parameter Settings> to enter the device parameter setting page.

On the [Basic Info] tab, configure the device name, device address and bus listening feature.



Device list: Basic Info RS-485 aa Aaa Aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa	
aa	1
Name: aa	
Addr: 0	
Listening off	
✓ Alter	

Figure 11 Basic Parameter Setting

Name

Configuration range: 2~28 characters

Function: Configure the device name.

Description: Device name is mandatory. It can contain Chinese characters, English characters and numbers, but not special characters.

Addr

Configuration range: 0~27

Function: Configure the device address information.

Bus Listening

Configuration options: Listening On/Off

Default configuration: Listening Off

Function: Whether to enable bus listening on the device.

For AUTBUS to RS485 converters, configure RS485 port parameters on the [RS-485] tab.



①Parameter Configuration		×
Device list:	Basic Info RS-485	
aa		
	Port: SUARTO V	
	Baud Ra 1200 V Stop bits: 1 bit V	
	Data bits: 5 bits v Parity: no-check v	
	Alter	

Figure 12 RS485 Parameter Setting

Port

Configuration options: SUART0/SUART1/SUART2

Function: Select the RS485 port to be configured.

Description: "SUART0" should be selected here.

Baud Rate

Configuration options: 1200/2400/4800/9600/19200/38400/56000/115200/128000/230

400/256000

Default configuration: 115200

Function: Configure the baud rate of the RS485 port, that is, the number of bits transmitted per second.

Description: Baud rate is the most important parameter in RS485 communication. It determines the amount of data transmitted per second. The higher the baud rate, the faster the transmission speed and the more the power consumption. The transmitting end and the receiving end should have the same baud rate configured.

Stop Bits

Configuration options: 1 bit/1.5 bits/2 bits

Default configuration: 1 bit



Function: Configure the stop bit of the RS485 port.

Description: Stop bit marks the end of a data transmission. Generally, the stop bit of RS485 transmission is 1 bit. You can adjust it as needed. The transmitting end and the receiving end should have the same number of stop bits configured.

Data Bits

Configuration options: 5 bits/6 bits/7 bits/8 bits

Default configuration: 8 bits

Function: Configure the data bits of the RS485 port.

Description: Data bits specify the number of bits used in each data byte. The transmitting end and the receiving end should have the same number of data bits configured.

Parity

Configuration option: No-check/Odd/Even

Default configuration: No-check

Function: Select the parity mode.

Description: Parity is used to check data integrity. Besides the transmitted data bits, one

parity bit is transmitted to make sure the transmitted data bits meet the specified requirement.

The transmitting end and the receiving end should have the same parity mode configured.

- > No-check: No parity check is performed on transmitted data bits.
- Odd: The number of "1" bits in the binary string including the nine data bits and one parity bits must be odd.
- Even: The number of "1" bits in the binary string including the nine data bits and one parity bits must be even.

2.5.4 Reboot

On the [Node Configuration] tab, select a device and click <Reboot>. Then the device will be rebooted.



Warning:

If the device acting as MN is rebooted, all nodes in the network will be rebooted.



Autbus Network	Node Configu	iration R	esource C	onfiguration								
🖇 Refresh 🖞 F	rmware Update	🕸 Paramet	er Setting	s 🕐 Reboo	t 🛛 🐥 Open	LED	유 Close LED					
Index Dial Co	de Device Name	Device UID		Device Addr	Node Type	Role	App Ver	Device State	Bus Listening	Channel Quality	Runtime Duration	
1	сс	EF:40:18:4	19:4F:2A	85	MNSDK	MN	sdk3.01	Configuring	<u>Listen</u>	<u>View</u>	0d 0h 3m 5s	
2	аа	EF:40:18:5	5E:49:29	222	TNSDK	TN	24-04-03,11:47	Working	<u>Listen</u>	<u>View</u>	0d 0h 3m 5s	

Figure 13 Reboot Device

2.5.5 Configure Bus Listening

On the [Node Configuration] tab, click <Listen> in the "Bus Listening" column of a device to enter the bus listening statistics page.

To collect bus listening statistics of a device, you need enable the bus listening feature on the device's parameter setting page.

Start C	apture 5	912	T _× Origin	al Mess	age 🛢	Export Exc	cel 🍸 Bussi	ness Data			
Fran	ne ID	SYMID	Туре	Len	Src	Des	Err	Data			
= 0x3	e279	4	0x2	27	7	41	Null	000079e20	030000000000	0100000000000000000	000
Send 7	ling Node:										
Rece 41	iving Node:										
Data 27	Length:										
Mess Head unde	age ler: efined										
Data 0000 0000 0000 0000	Content: 079e20300 000000100 000000000 00000000000										
0x3	e279	4	0)	(9	10)	1	2	Null	ff06013d03	

Figure 14 Configure Bus Listening



Start/Stop

Function: Click <Start> to start listening on the device and <Stop> to stop listening.

Capture...

Function: Display the number of captured packets after listening is started.

Original Message

Function: With this option selected, the page displays the original packets in the captured packets.

Business Data

Function: With this option selected, the page displays the service packets in the captured packets.

Export Excel

Function: Click this option to export the captured packet statistics to an EXCEL file, which will be saved in the directory of the configuration tool.

2.5.6 View Traffic Statistics

On the [Node Configuration] tab, click <View> in the "Traffic Statistics" column of a device to enter the traffic statistics display page.

Traffic Stat	istics	da						
acketsSend	BytesSent	PacketsLoss	BytesLoss	PacketsReceived	BytesReceived	SendingRate(Mbps)	ReceivingRate(Mbps)	Delay(us)
0	0	0	0	0	0	0.000000	0.000000	0

Figure 15 View Traffic Statistics



This page displays the device's traffic statistics, including the data sent, received, discarded as well as sending rate and delay, etc.

2.5.7 View Channel Quality

On the [Node Configuration] tab, click <View> in the "Channel Quality" column of a device to enter the channel quality display page.

1)Channel Qualityaa									
ndex	Device name	Two-wire Packets	Two-wire Error Packets	Bit Error Rate	SNR(dB)	Amplitude	AGC(dB)	Synch state	
L	CC	5556d6	DOWN:5b3 UP:0	2.609e-04	DOWN:42 UP:39	DOWN:106 UP:94	-3	DOWN:1#2 UP:1#2	

Figure 16 View Channel Quality

This page displays the number of two-wire packets, two-wire error packets, bit error rate, etc., on the device. Fewer error packets and slower error packet growth rate indicate better channel quality. Channel quality is optimal when SNR is above 30 dB.

2.6 Configure Resources

AUTBUS resources must be configured so that nodes on the network can communicate with each other. The AUTBUS configuration tool provides dynamic and static configuration methods. To use the dynamic configuration method, you need to enable the dynamic bandwidth allocation function. When it is disabled, you can manually configure resources.



2.6.1 View Resource Configurations

For manual configuration, multiple resource blocks can be allocated. You can view and modify resource block configurations on the [Resource Configuration] tab, as shown in the following figure.

A	utbus Network	Node Config	guration Res	ource Configu	ration					
÷	Add 🔳 Delete	e 💥 Clear	🖥 Save 🛛 🔌 Ur	ndo 🛛 🗇 Refres	h 📥 Ne	etwork Topology				
	Serial Number	Resource ID	Frame Interval	Start Position	Symbol	Allocated Bandwidth (Mbps)	Channel Type	Edit	Sending Node	Receiving Node
	1	1	Interval 2-0	5	2	0.984	NORMAL	<u>Edit</u>	сс	,aa
	2	2	Interval 2-0	7	2	0.984	NORMAL	<u>Edit</u>	aa	,CC

Figure 17 View Resource Configurations

Add

Function: Click this button to enter the resource block creation page.

Delete

Function: Select one or more resource blocks and then click this button to delete the resource block configuration.



Warning:

When deleting resource blocks, you need to delete those with larger symbol numbers first.

Otherwise, the deletion might result in a communication failure.

Clear

Function: Click this button to delete the configuration of all resource blocks.

Save

Function: After modifying resource block configurations, such as resource block creation,



deletion and corresponding cancellation operations, etc, you need to click <Save> and then reboot the devices. Otherwise, the previously mentioned modifications do not take effect.

Undo

Function: After modifying resource block configurations, such as resource block creation, deletion, etc, you can click the <Undo> button to cancel the operation if the operation is not saved yet.

Refresh

Function: Click this button to refresh the current page.

Network Topology

Function: Click this button to enter the page displaying the topology graph of the AUTBUS network.

To modify the configuration of a specific resource block, click <Edit> in the "Edit" column.

2.6.2 Create Resources

On the [Resource Configuration] tab, click <Add> to enter the resource configuration

page.

Resource configuration								
Interval:	Interval 2-0	Symbol 2	Send-N: cc 🗸	Recv-N:	,aa 🗸			
StartPos:	5 🗸	Broadcast: No	Channel: NORMAL 🗸		ave Settings			
0 1 2	2 3 4 <mark>5 6</mark> 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	53545556575859 <mark>60616263</mark>			
F0 P P	B B I P O I I I I I I I I	I I I I I I I I I I I I I I I I	IIIIIIIIIIIII	I I I I I I I I I	IIIIIIIBPPA			
S S 0	C C D <mark>S</mark> C D D D D D D D C	D D D D	DDDDDDDDDDDDDDDDD	D D D D D D D D D	DDDDDDDC <mark>SS</mark> C			
0 1 5	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	53545556575859 <mark>60616263</mark>			
F1 P P 5	B B I I I I I I I I I I I I	I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 5	C C D D D D D D D D D D D D	D D D D	D D D D D D D	D D D D D D D D D	D D D D D D D <mark>C S S C</mark>			
013	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	53545556575859 <mark>60616263</mark>			
F2 P P I	B B I P O I I I I I I I I	I I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 0	C C D S C D D D D D D D C	D D D D	D D D D D D	D D D D D D D D D	D D D D D D D C <mark>S S C</mark>			
0 1 2	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	53545556575859 <mark>60616263</mark>			
F3 P P 1	B B I I I I I I I I I I I I	I I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 0	C C D D D D D D D D D D D D D	D D D D	D D D D D D	D D D D D D D D D D	D D D D D D D C <mark>S S C</mark>			
0 1 2	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	5354555657585960 <mark>616263</mark>			
F4 P P I	B B I P O I I I I I I I I	I I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 0	C C D <mark>5</mark> C D D D D D D D D	D D D D	D D D D D D	D D D D D D D D D	D D D D D D D <mark>C S S C</mark>			
0 1 2	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	5354555657585960 <mark>616263</mark>			
F5 P P 1	B B I I I I I I I I I I I I	I I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 0	C C D D D D D D D D D D D D C	D D D D	D D D D D D	D D D D D D D D D	D D D D D D D <mark>C S S C</mark>			
0 1 2	2 3 4 5 6 7 8 9 101112131	41516171819202122232425262728293	031323334353637383940414243	444546474849505152	53545556575859 <mark>60616263</mark>			
F6 P P I	B B I P O I I I I I I I I	I I I I I I I I I I I I I I I I I	I I I I I I I I I I I I I I	I I I I I I I I I	I I I I I I B P P A			
S S 0	C C D <mark>S</mark> C D D D D D D D C	D D D D	D D D D D D	D D D D D D D D D	D D D D D D D <mark>C S S C</mark>			
0 1 5 F7 P P 5 S S 0	2 3 4 5 6 7 8 9 101112131 B B I I I I I I I I I I I I C C D D D D D D D D D D D D D	41516171819202122232425262728293 I I I I I I I I I I I I I I I I I D D D D	031323334353637383940414243 I I I I I I I I I I I I D D D D D D D D	444546474849505152 I I I I I I I I I D D D D D D D D D D	53545556575859 <mark>60616263</mark> I I I I I I I B P P A D D D D D D D C <mark>S S C</mark>			
PS:Pilot Symbol BC:Broadcast ID:Idle AC:Access OC:Occupancy								





Interval

Configuration options: Interval 1-0/Interval 2-0/Interval 2-1/Interval 4-0/Interval 4-

1/Interval 4-2/Interval 4-3/Interval 8-0/Interval 8-1/Interval 8-2/Interval 8-3/Interval 8-4/Interval

8-5/Interval 8-6/Interval 8-7

Default configuration: Interval 1-0

Function: Configure the number of cyclic frames, that is, the transmission interval.

Description: "Interval 2-0" indicates the first case when the number of cyclic frames is 2.

Likewise, "Interval 8-3" indicates the fourth case when the number of cyclic frames is 8.

StartPos

Configuration range: 4~59

Function: Set the start symbol number of the resource block.

Description: Symbols numbered 0 to 3 and 60 to 30 are occupied by the system. You can allocate the symbols numbered 4 to 59.

Symbol...

Configuration range: 2~57

Function: Configure the number of symbols in a resource block.

Description: Each resource block should have at least two symbols. For example, "5" indicates that the resource block has five symbols.

Broadcast

Configuration options: Yes/No

Default configuration: No

Function: Whether to enable broadcasting.

Description: When broadcasting is enabled, all nodes on the AUTBUS network are specified as receiving nodes. In this case, "Recv-N" does not need to be configured.

Send-N

Configuration options: All nodes

Function: Select the device which sends data in this resource block. Each resource block can be configured with only one sender.



Recv-N

Configuration options: All nodes

Function: Select the device which receives data in this resource block. Each resource

block can be configured with multiple receivers.

Channel

Configuration options: NORMAL (mandatory)

Function: Display the channel type.