instruction manual

AXB-232++

RS-232/422/485 Interface

AXlink Bus Controllers

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Product Information

The AXB-232++ RS-232/422/485 Interface is an AXlink bus controller that provides remote control for devices that require a variety of control protocols. The AXB-232++ extends RS-232, RS-422, or RS-485 control to remote sources over the 4-wire AXlink data/power bus.

Onboard processing and memory allows the controller to take on complex tasks by itself, reducing the processing burden for the Axcess control system. For example, the control system can use simplified commands for generic video switcher or code control, a modular driver program in the AXB-232++ can process control for specific makes and models.

Front Panel

FIG. 1 displays the front panel of the AXB-232++.

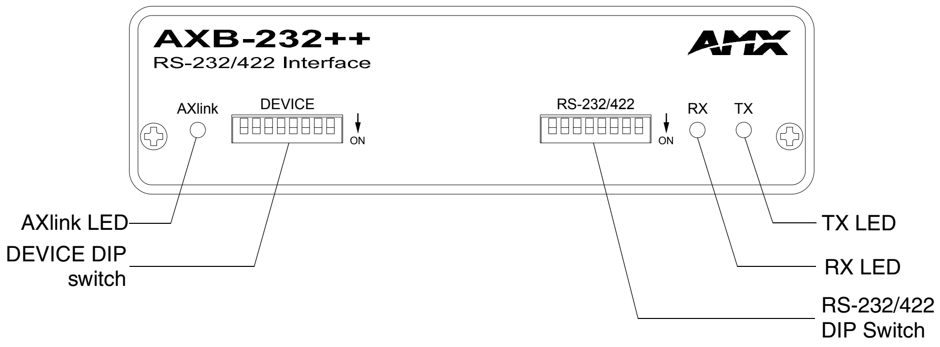


FIG. 1 AXB-232++ front panel

Rear Panel

FIG. 2 displays the rear panel of the AXB-232++.

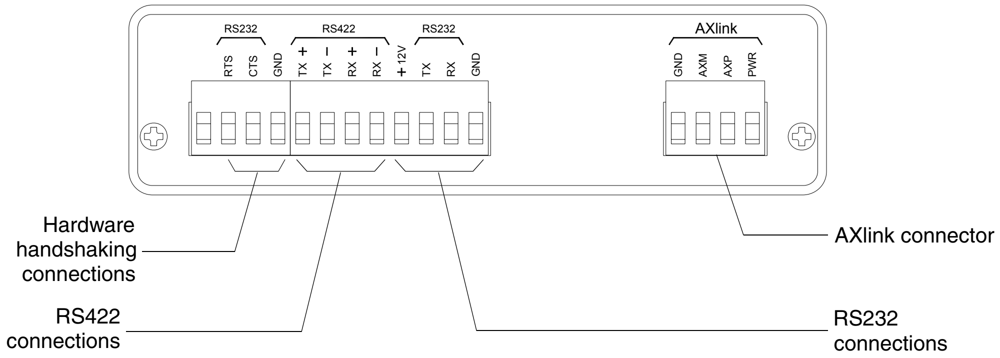


FIG. 2 AXB-232++ rear panel

Specifications

The following table lists the specifications for the AXB-232++.

Specifications	
Power	12 VDC @ 160 mA
Processor	On board 32-bit processor and 384K (of non-volatile memory) run Axcess programs independent of the control system. This relieves the AXlink bus and controller for the processing time for controlling those devices. (Requires Axcess Version 3.0 or higher.)
Asynchronous data standards	• Baud rates - *300*, *600*, *1200*. *2400*, *4800*, *9600*, *19200* and *38400*. *56400* is supported via the BAUDMED Send Command (see the *Send_Commands* section on page 9 for details). *115200* is supported via the BAUDHIGH Send Command (see the *Send_Commands* section on page 9 for details). • Data bits - 7, 8, and 9 • Stop bits - 1 and 2 • Parity - *None*, *Odd*, *Even*, *Mark* and *Space*
Buffers	• 1KB input buffer • 1KB AXlink buffer
Front Panel	
AXlink LEDs	Green AXlink status indicator: • *Full-Off* indicates no power is being received or the controller is not functioning properly. • *One blink per second* power is active and AXlink communication is functioning. • *Full-On* indicates power is active and AXlink data communication is not functional.
RX LED (Red)	Blinks to indicate the AXB-232++ is receiving RS-232, RS-422, or RS-485 data. *The RX LED blinks even if the data being received is incorrect.*
TX LED (Red)	Blinks to indicate the AXB-232++ is sending RS-232, RS-422, or RS-485 data.
DEVICE DIP Switch	An eight-position DIP switch used to set the device number for the AXB-232++. Refer to *Setting the DEVICE DIP switch, on* page 4, and *Setting jumper JP5 to set the RS-422 port for RS-485 use* section on page 4 for more information.
RS232/422 DIP Switch	An eight-position DIP switch used to set the communication parameters for the RS-232/422 device. Refer to *Setting the RS-232/422 DIP switch*, on page 5, for more information.
Rear Panel	
Hardware handshaking connector	An RTS/CTS data connector that can be wired for hardware handshaking if called for by the controlled device (4-pin male).
RS422/232 connector	A captive-wire connector wired for RS-422/232 data control (8-pin male).
AXlink connector	Receives power and data via the AXlink bus and AXlink system controller (4-pin male).
Internal Jumpers	Sets differential input termination and enables RS-485 output.
Supports	XON/XOFF software and hardware handshaking
Dimensions (HWD)	1.5" x 5.5" x 5.5" (3.81 cm x 13.97 cm x 13.97 cm)
Weight	1.1 lbs. (498.95 g)
Enclosure	Metal with black matte finish
Included Accessories	• AXlink connector (4-pin female) • Phoenix connector (8-pin male)
Optional Accessories	• CC-232 Control Cable • AC-RK Accessory Rack Kit • 12 VDC power supply, 800 mA

Installation and Wiring

The AXB-232++ can be used as an independent RS-232/422/485-controlled interface by setting the internal jumpers. Configure the communication parameters using the DIP switches on the front panel.

Setting the Internal Jumpers

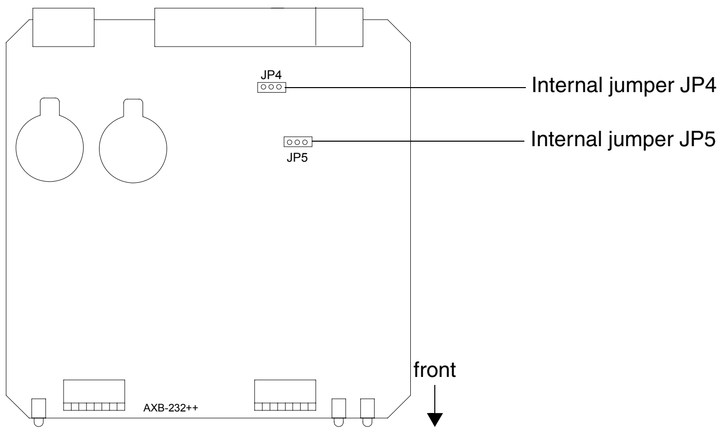


FIG. 3 Location of internal jumpers

Setting jumper JP4 to terminate RS-422 input with 100 ohms

Terminating a device involves installing a 100 ohm line terminator, this is typically used to achieve better communication and signal integrity. You will want to terminate when the communication is at a high data rate or over a long distance. Termination can be harmful because it increases the current in the line, and more radiation that could interfere with signals.

Jumper JP4 places 100 Ohms termination across RS422 receive data pins 5 & 6:

1. Disconnect the RS-232/422/485 connectors.
2. Unscrew the two screws on the rear panel, and remove the panel.
3. Slide the circuit board out of the enclosure.
4. Locate the JP4 jumper (FIG. 3).
5. Install the jumper in the 'ON' position (default setting = OFF).
6. Slide the circuit board back into the enclosure.
7. Replace the panel, and refasten the screws.
8. Reconnect the RS-232/422/485 connectors.

Setting jumper JP5 to set the RS-422 port for RS-485 use

1. Disconnect the RS-232/422/485 connectors.
2. Unscrew the two screws on the rear panel, and remove the panel.
3. Slide the circuit board out of the enclosure.
4. Locate the JP5 jumper (see FIG. 3 on page 3).
5. Set jumper JP5 to the ON position (the default setting is OFF).
6. Slide the circuit board back into the enclosure.
7. Replace the panel, and refasten the screws.
8. Reconnect the RS-232/422/485 connectors.

Setting the DIP Switches

NOTE

Use the DIPSwitch 2.0 application available for free download from AMX to quickly figure out DIP Switch settings for all types of DIP Switches.

Setting the DEVICE DIP switch

Set the device number on DEVICE DIP switch, located on the front of the AXB-232++. The device can be 1 of the 255 devices in an Axcess control system. The device number must match the device assignment in the Axcess program. Device numbers are assigned into the following three segments:

- **Cards** 1 through 95
- **Boxes** 96 through 127
- **Panels** 128 through 255

Set the device number by setting the device DIP switches. The device number is the total of all of the switches in the ON position, and take effect by cycling the power. The following table shows the switch numbers and their corresponding values.

DEVICE DIP Switch Settings

Position	1	2	3	4	5	6	7	8
Value	1	2	4	8	16	32	64	128

Setting the RS-232/422 DIP switch

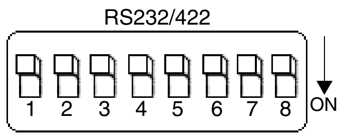
Set the stop bits, data bits, parity, and baud rate on the RS-232/422 DIP switch, located on the front panel (see FIG. 1 on page 1). The AXB-232++ supports the following asynchronous data standards:

- **Stop bits** 1 and 2
- **Data bits** 7, 8, and 9
- **Parity** None, Odd, Even, Mark, and Space
- **Baud rates** 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200 and 38,400.
  - **57,600** is achieved by setting the DIP switch to 300 baud, and using the ’BAUDMED’ Send_Command (see the *Send_Commands* section on page 9 for details).
  - **115,200** is achieved by setting the DIP switch to 300 baud, and using the ’BAUDHIGH’ Send_Command (see the *Send_Commands* section on page 9 for details).

The table below shows the RS-232/422 DIP switch numbers, functions, and their corresponding values.

RS-232/422 DIP Switch Settings

Switch	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Function	**Stop Bits**	**Data Bits**		**Parity**			**Baud Rates**	
Setting	Off	Off	Off	Off	Off	Off	Off	Off
Value	2 bits	7 bits		Unused			300	
	On	On	On	Off	Off	On	Off	Off
	1 bit	8 bits		Unused			600	
			Off	On	Off	Off	On	Off
				Unused			1,200	
			On	On	Off	On	On	Off
				Unused			2,400	
			Off	Off	On	Off	Off	On
				Mark			4,800	
			On	Off	On	On	Off	On
				Even			9,600	
			Off	On	On	Off	On	On
				Odd			19,200	
			On	On	On	On	On	On
				None			38,400	



Wiring Devices to the AXB-232++

Preparing captive wires

To connect the wiring into a captive-wire connector:

1. Strip 1/4 inch off the wire insulation for all four wires.
2. Tin 2/3 of the exposed wire.
3. Insert each wire into the appropriate captive-wire connector up to the insulation.
4. Tighten the captive screws to secure the fit in the connector.

CAUTION

If the device is using a separate power supply, do not connect the power wiring from the AXB-232++ to that device.

Wiring guidelines

The interface requires a 12 VDC power to operate properly. The interface uses a PSN2.8 power supply. The Central Controller supplies power via the AXlink cable or external 12 VDC power supply. The maximum wiring distance between the Central Controller and interface is determined by power consumption, supplied voltage, and the wire gauge used for the cable. The table below lists wire sizes and maximum lengths allowable between the AXB-RS232++ and Central Controller. The maximum wiring lengths for using AXlink power are based on a minimum of 13.5 volts available at the Central Controller's power supply.

Wiring Guidelines at 160 mA	
Wire Size	**Maximum Wiring Length**
18 AWG	733.57 feet (223.59 m)
20 AWG	464.11 feet (141.46 m)
22 AWG	289.35 feet (88.19 m)
24 AWG	182.39 feet (55.59 m)

Using AXlink

Connect the AXlink wiring to the connector on the AXB-232++ as shown in FIG. 4.

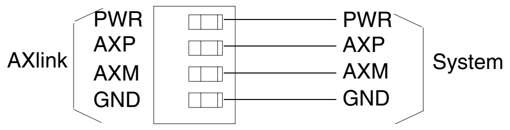


FIG. 4 AXlink bus and +12 VDC power wiring

Using AXlink and External Power Supply

Connect the AXlink and power wiring to the connector on the AXB-232++ as shown in FIG. 5.

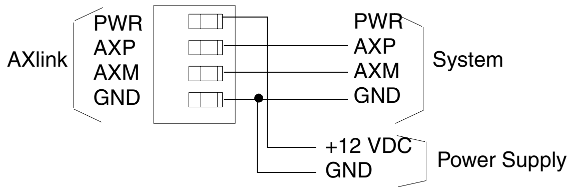


FIG. 5 AXlink bus and +12 VDC power wiring

Using RS-232

When communicating via RS-232, connect the wiring as shown in FIG. 6.

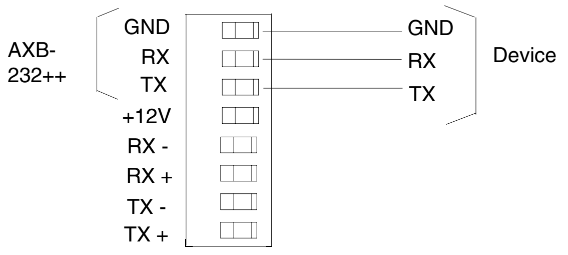


FIG. 6 RS-232 wiring

Using Hardware Handshaking

When the controlled device requires hardware handshaking, connect the wiring as shown in FIG. 7.

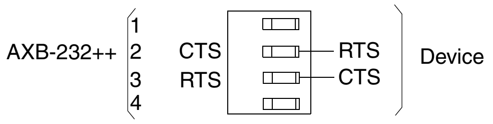


FIG. 7 Hardware handshaking wiring

Using RS-422

When communicating via RS-422, connect the wiring as shown in FIG. 8.

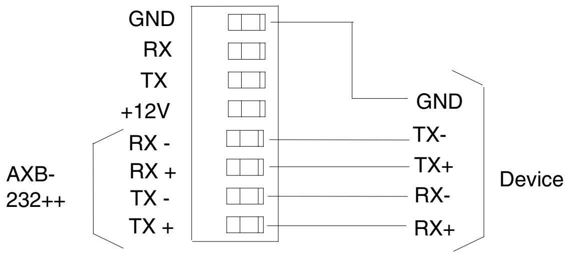


FIG. 8 RS-422 wiring

Using RS-485

When communicating via RS-485, connect the wiring as shown in FIG. 9.

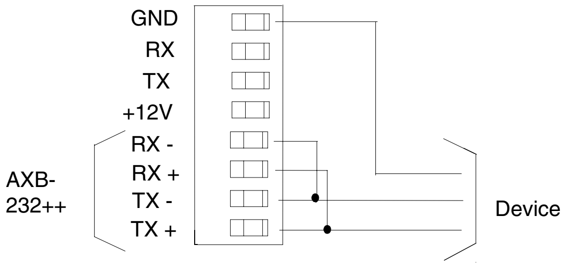


FIG. 9 RS-485 wiring

Rack-mounting the AXB-232++ (optional)

To rack-mount the AXB-232++ into the optional AC-RK Accessory Rack Kit:

1. Remove any connected power, and AXlink and RS-232 connectors from the rear panel.
2. Remove the two screws on the front panel of the AXB-232++.
3. Remove the front panel and space bracket behind the panel.
4. Place the unit in the appropriate opening in the AC-RK.
5. Place the front panel of the AXB-232++ on the front of the rack, over the unit.
6. Fasten the front panel to the rack and unit with the two screws you removed.

Replacing the Lithium Batteries

The AXB-232++'s lithium batteries have a life of approximately 5 years to protect its memory. When DC power is on, the batteries are not used. When you install the AXB-232++, record the date the batteries should be replaced.

DANGER

There is a danger of explosion if you replace the batteries incorrectly. Replace batteries with the same or equivalent type recommended by the manufacturer. Dispose of the used batteries according to the manufacturer's instructions. Never recharge, disassemble, or heat batteries above 212°F (100°C). Never solder directly to the batteries or expose the contents of the batteries to water.

Before removing the lithium batteries, contact your dealer and verify that they have a current copy of your program to avoid an inadvertent loss of data and prevent an unnecessary service outage.

1. Discharge the static electricity from your body.
2. Unplug the two-pin power connector and any other connectors.
3. Remove the two screws on the front panel.
4. Remove the front panel, and slide the circuit board out of the enclosure.
5. Carefully slide each battery out of its socket (FIG. 10), and insert the new battery.

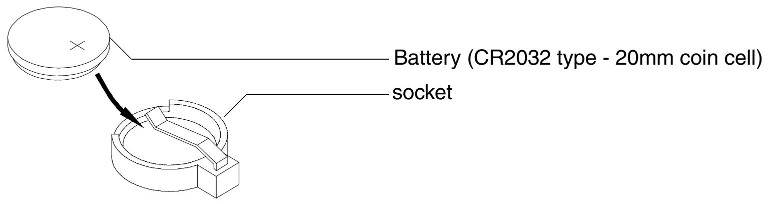


FIG. 10 Lithium battery and socket

6. Slide the circuit board back into the enclosure.
7. Replace the front panel and refasten the two screws.
8. Reconnect any connectors that you removed.

Programming

Send_Commands

The AXB-232++ supports the same command set as the AXC-232. The following table lists the AXB-232++ Send_Commands.

AXB-232++ Send_Commands	

B9MOFF
Sets data bit mode to normal with DIP switch settings (default).
	Syntax:
	`'B9MOFF'`
	Example:
	`SEND_COMMAND AXB232,'B9MOFF'`
	Sets the data bit mode to normal.

B9MON
Enables a special mode to override DIP switch settings.
	Syntax:
	`'B9MON'`
	The mode, nine data bits with one stop bit, overrides the data, stop, and parity settings. When the AXB-232++ issues this command, it locks in the baud rate determined by the current DIP switch setting.
	Example:
	`SEND_COMMAND AXB232,'B9MON'`
	Overrides the DIP switch settings.

BAUDHIGH
Enables 115,200 baud rate when the DIP switch is set to 300 baud.
	Syntax:
	`'BAUDHIGH'`
	Example:
	`SEND_COMMAND AXB232,'BAUDHIGH'`
	Enables 115,200 baud rate.

BAUDLOW
Enables 300 baud rate when the DIP switch is set to 300 baud setting (default).
	Syntax:
	`'BAUDLOW'`
	Example:
	`SEND_COMMAND AXB232,'BAUDLOW'`
	Enables 300 baud rate.

BAUDMED
Enables 57,600 baud rate when the DIP switch is set to 300 baud.
	Syntax:
	`'BAUDMED'`
	Example:
	`SEND_COMMAND AXB232,'BAUDMED'`
	Enables 57,600 baud rate.

CB1ON
Enables placement of characters in the buffer specified by CREATE_BUFFER 1 (default).
	Syntax:
	`'CB1ON'`
	Example:
	`SEND_COMMAND AXB232,'CB1ON'`
	Enables placement of characters in the buffer.

CB1OFF
Disables placement of characters in the buffer specified by CREATE_BUFFER 1.
	Syntax:
	`'CB1OFF'`
	Example:
	`SEND_COMMAND AXB232,'CB1OFF'`
	Disables placement of characters in the buffer.

AXB-232++ Send_Commands (Cont.)	

CHARD
Sets delay between all transmitted characters to the increment specified.
	Syntax:
	`'CHARD-<time>'`
	Variable:
	time = 100 microsecond increments 0 - 255.
	Example:
	`SEND_COMMAND AXB232,'CHARD-10'`
	Sets 1mS delay between all transmitted characters.

CTSPSH
Enables PUSHes and RELEASEs.
	Syntax:
	`'CTSPSH'`
	Example:
	`SEND_COMMAND AXB232,'CTSPSH'`
	Enables PUSHes, RELEASEs, and status on channel 255 ([0,255] within the AXB-232++) for CTS hardware handshake input. If CTS is high, the channel is on.

CTSPSHF
Disables the 'CTSPSH' command.
	Syntax:
	`'CTSPSHF'`
	Example:
	`SEND_COMMAND AXB232,'CTSPSHF'`
	Disables the 'CTSPSH' command.

EOFF
Disables the 'EON ' command (default).
	Syntax:
	`'EOFF'`
	Example:
	`SEND_COMMAND AXB232,'EOFF'`
	Disables the 'EON' command.

EON
Forces the AXB-232++ to ignore the transmitted characters on its receiver.
	Syntax:
	`'EON'`
	Example:
	`SEND_COMMAND AXB232,'EON'`
	Forces the AXB-232++ to ignore the transmitted characters on its receiver. When using RS-485, the transmitter and receiver are tied together.

HSOFF
Disables hardware handshaking (default).
	Syntax:
	`'HSOFF'`
	Example:
	`SEND_COMMAND AXB232,'HSOFF'`
	Enables placement of characters in the buffer.

HSON
Disables placement of characters in the buffer specified by CREATE_BUFFER 1.
	Syntax:
	`'HSON'`
	Example:
	`SEND_COMMAND AXB232,'HSON'`
	Enables hardware handshaking.

RXCLR
Clears any characters in the Receive buffer waiting to be sent to the Master.
	Syntax:
	`'RXCLR'`
	Example:
	`SEND_COMMAND AXB232,'RXCLR'`
	Clears any characters in the Receive buffer waiting to be sent to the master. If 'RXCLR' is sent while RTS is low, RTS returns high.

AXB-232++ Send_Commands (Cont.)	

RXOFF
AXB-232++ does not pass on received characters to the Master (default).
	Syntax:
	`'RXOFF'`
	Example:
	`SEND_COMMAND AXB232,'RXOFF'`
	AXB-232++ does not pass on received characters to the master.

RXON
Enables AXB-232++ to send incoming characters received to the Master.
	Syntax:
	`'RXON'`
	Example:
	`SEND_COMMAND AXB232,'RXON'`
	Enables AXB-232++ to send incoming characters received to the master.
	The AXB-EM automatically sends this command to the AXB-232++ when it executes a 'CREATE_BUFFER' program instruction.

TXCLR
Clears and stops any characters waiting in the Transmit buffer.
	Syntax:
	`'TXCLR'`
	Example:
	`SEND_COMMAND AXB232,'TXCLR'`
	Clears and stops any characters waiting in the Transmit buffer.

XOFF
Disables software handshaking (default).
	Syntax:
	`'XOFF'`
	Example:
	`SEND_COMMAND AXB232,'XOFF'`
	Disables software handshaking.

XON
Enables software handshaking.
	Syntax:
	`'XON'`
	Example:
	`SEND_COMMAND AXB232,'XON'`
	Enables software handshaking.

ZAP!
Clears the Axcess program in the AXB-232++.
	Syntax:
	`'ZAP!'`
	Example:
	`SEND_COMMAND AXB232,'ZAP!'`
	Clears the Axcess program in the AXB-232++.

Axcess program characteristics

The AXB-232++ is capable of running Axcess programs. It handles string processing, relieving AXlink and the Master of the processing times.

Send_String Escape Sequences

The AXB-232++ does not regard certain three-character combinations within a Send_String program as literal characters, but as commands. The following table lists those combinations.

Send_String Escape Sequences	

27,17,<time>
Sends a break character of the specified length of time.
	Syntax:
	`"27,17,<time>"`
	Variable:
	time = 100 microsecond increments 1 - 255.
	Example:
	`SEND_STRING AXB232,"27,17,10"`
	Sends a break character of 1mS.

27,18,1
Sets the ninth data bit to 1 for all of the following characters to be transmitted.
	Syntax:
	`"27,18,1"`
	Example:
	`SEND_STRING AXB232,"27,18,1"`
	Sets the ninth data bit to 1 for all of the following characters to be transmitted. Used in conjunction with the 'B9MON' command.

27,18,0
Clears the ninth data bit to 0 for all of the next characters to be transmitted.
	Syntax:
	`"27,18,0"`
	Example:
	`SEND_STRING AXB232,"27,18,0"`
	Clears the ninth data bit to 0 for all of the next characters to be transmitted. Used in conjunction with the 'B9MON' command.

27,19,<time>
Inserts a delay before the next character to be transmitted.
	Syntax:
	`"27,19,<time>"`
	Variable:
	time = 100 microsecond increments 1 - 255.
	Example:
	`SEND_COMMAND AXB232,"27,19,10"`
	Inserts a 1mS delay before the next character to be transmitted.

27,20,0
Asserts RTS hardware handshake output high.
	Syntax:
	`"27,20,0"`
	Example:
	`SEND_COMMAND AXB232,"27,20,0"`
	Asserts RTS hardware handshake output high.

27,20,1
Asserts RTS hardware handshake output low.
	Syntax:
	`"27,20,1"`
	Example:
	`SEND_COMMAND AXB232,"27,20,1"`
	Asserts RTS hardware handshake output low.

AXB-232++ Program Statements

The Axcess program of the AXB-232++ communicates with the master as Device 0. Its device communicates with the RS232/422 Input/Output (I/O) of the AXB-232++ as Device 1. The following table lists AXB-232++ statements.

AXB-232++ Program Statements

Statement	Function
`CREATE_BUFFER 0,`*`buffer`*	Places strings that come from the Master into *buffer.* If no `CREATE_BUFFER 0` exists, the incoming strings from the Master are sent out the RS232 port.
`CREATE_BUFFER 1,`*`buffer`*	Places strings that come from the RS-232 port into *buffer.* If no `CREATE_BUFFER 1`, exists, the incoming strings are sent to the Master.
`CREATE_BUFFER 2,`*`buffer`*	Places commands (i.e. `SEND_COMMANDs`) that come from the AXlink Master into the *buffer.* Each command will be preceded by 2 characters: The first character will always be an '*', the second character is the length of the command, the remaining *n* characters (as given in the second character) are the command itself.
`CREATE_LEVEL 0,`*`level,variable`*	Places levels sent by the master for *level* in *variable*.
`OFF[0,`*`channel`*`]`	• Sends a RELEASE to the Master. • Sends a message that *channel* is off.
`OFF[1,`*`channel`*`]`	Turns off a *channel.* This command has no external effect. It can be used as status.
`ON[0,`*`channel`*`]`	• Sends a PUSH to the Master. • Sends a message that *channel* is on.
`ON[1,`*`channel`*`]`	Turns on *channel*. This command has no external effect. It can be used as status.
`SEND_COMMAND 0,`*`command`*	Sends *command* to the Master. Provides support for commands like `'RDS'`.
`SEND_COMMAND 1,`*`command`*	Sends *command* to the AXB-232++ as if the Master had sent it.
`SEND_COMMAND AXB_232, 'BAUDHIGH'`	Sets the baud rate to 115.2k (DIP switch set to 300).
`SEND_COMMAND AXB_232, 'BAUDLOW'`	Sets the baud rate to 300 (DIP switch set to 300).
`SEND_COMMAND AXB_232, 'CB1ON'`	Enables placement of characters in the *buffer* specified by `CREATE_BUFFER 1.`
`SEND_COMMAND AXB_232, 'CB1OFF'`	Disables placement of characters in the *buffer* specified by `CREATE_BUFFER 1.`
`SEND_LEVEL 0,`*`level,variable`*	Sends *variable* as the value for level.
`SEND_STRING 0,`*`string`*	Sends *string* to the Master.
`SEND_STRING 1,`*`string`*	Sends *string* out the RS-232 port.

Xmodem Timing Commands

The following table lists the AXB-232++ Xmodem timing commands. Xmodem timeouts exist to accommodate potential Ethernet delays and for consistency among and within products. Any Xmodem timing command will change timing and retries for Axcess code download as well as Softrom transfer.

Xmodem Timing Commands	
Command	**Description**
`'TIMEOUT XX'`	Xmodem timeouts via the Program Port. (Default is 10 sec.)
`SEND_COMMAND SERIAL, 'XMTO XX'`	Over AXlink, where `XX` is from one to 50 seconds in 1-second increments.
`'RETRY XX'`	Xmodem retries via the Program Port. (Default is 5.)
`SEND_COMMAND SERIAL, 'XMRT XX'`	Over AXlink where `XX` is from one to 10 in increments of one.

AXlink Master Statements

The following table lists the AXlink Master statements for the AXB-232++.

AXlink Master Statements	
Statement	**Function**
`MIN_TO`	Activates a channel or variable for a minimum amount of time-even if the corresponding device-channel is released. The time duration is determined by SET_PULSE_TIME.
`ON[AXB_232,` *`channel`*`]`	Executes PUSH[0,*channel*] within AXB-232++.
`OFF[AXB_232,` *`channel`*`]`	Executes RELEASE[0,*channel*] within AXB-232++.
`PULSE`	Turns on a channel or variable for a certain amount of time. Once the time elapses, the channel or variable is turned off. The Pulse time remains the same value until it is changed within the program. Example: `SET_PULSE_TIME(12)` Sets the current duration of future Pulses to 1.2 seconds.
`SEND_COMMAND AXB_232,`*`command`*	AXB-232++ interprets *command*.
`SEND_LEVEL AXB_232,`*`level, variable`*	Places the *variable* into the CREATE_LEVEL variable, if it were defined in the AXB-232++ DEFINE_START section.
`SEND_STRING AXB_232,`*`string`*	Places the *string* into the CREATE_BUFFER buffer, if you defined the buffer in the AXB-232++ DEFINE_START section. If it were not, this command transmits the *string* out the RS-232 port.
`TO`	Activates a channel or variable for as long as the corresponding device-channel of its Push statement is activated. When the device-channel referenced by the Push statement changes from off to on, the TO starts activating the device-channel or variable in the brackets following it. When the device-channel of its Push is released, the TO statement stops activating its device-channel or variable. For this reason, TO must be found only underneath a Push statement.

Reserved Channels

The following table lists the channels reserved on Device 0.

Reserved Channels

Channel	**Function**
Channel 254	This is only valid within the device and is not sent to the AXlink Master. Reflects AXlink status: • When AXlink is active, this channel is on. • When AXlink is inactive, this channel is off. • When this channel changes state, the AXB-232++ generates a PUSH or RELEASE.
Channel 255	Reflects the state of the CTS input. If the AXB-232++ receives a 'CTSPSH' command, it generates PUSHes for both the Master and the AXB-232++.

Axcess Master Mode

When an Axcess device is placed in "Master Mode", the Central Controller’s PROGRAM port is moved to the Axcess device’s RS-232 port.

Press the escape key, then type either **MC** or **MD**:

- <esc>**MC** - connects the device in Master Mode
- <esc>**MD** - disconnects the device

where <esc> means "press the Esc key".

NOTE

Master Mode can be very useful in situations where physical access to the Central Controller’s PROGRAM port is not practical (for example, in installations where the Central Controller is located a long distance from the bus device(s)).

AMX reserves the right to alter specifications without notice at any time.

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