

User Manual AX140510 Document Revision: A.3

USER MANUAL

Protocol Converter with J1939 & J2497

P/N: AX140510

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ACRONYMS

- CAN Controller Area Network
- EA The Axiomatic Electronic Assistant
- MID Message Identification
- MSB Most Significant Byte (or Bit)
- PID Parameter Identification Character
- PLC Power Line Communications
- RO Read Only Object
- RW Read/Write Object
- SID Sub-system Identification Number
- WO Write Only Object

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This user manual outlines the general configuration and operation of the AX140510 Protocol Converter. The AX140510 Protocol Converter has a CAN interface supporting J1939 messaging and a PLC transceiver for implementing J2497 Power Line Communications.

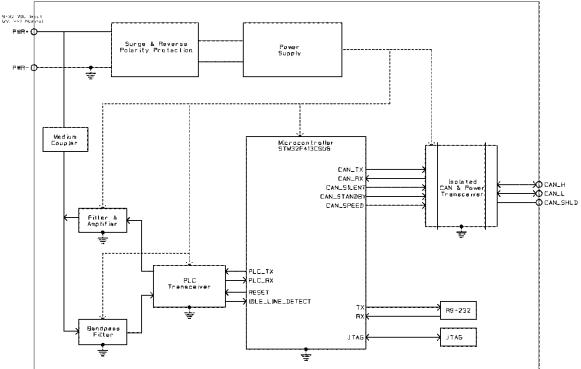


Figure 1: Protocol Converter block diagram

2. PROTOCOL CONVERTER USER INTERFACE

The Protocol Converter can be configured using Axiomatic Technologies' Electronic Assistant (EA) tool. In general, the configuration should be done using the most recent version of the Axiomatic Electronic Assistant (which can be downloaded from <u>www.axiomatic.com</u>).

The main network configuration options include setting CAN communication parameters (baud rate, etc.). From communication protocol point of view, both J1939 and J2497 receive and transmit configurations and diagnostics can be defined.

The message routing can be configured rather freely. The Protocol Converter can be also configured to actively request data from remote J1939 and J2497 nodes.

3. CONFIGURATION USING THE AXIOMATIC ELECTRONIC ASSISTANT

The following sections describe the different configuration options in detail.

3.1 J1939 Network Parameters

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	I2497 Outgoing Diagnostics Messages #3	^	Setpoint Name	Value	Comment
	J2497 Outgoing Diagnostics Messages #4		SPECU Address for CAN Network #1	0x80	Reserved for future assignment by SAE, but available for use by self cor
	J2497 Outgoing Diagnostics Messages #5		SP ECU Instance for CAN Network #1	0x00	#1 - First Instance
	I2497 Outgoing Diagnostics Messages #6		SPCAN #1 Transceiver Slew Rate	Slow	
	J2497 Outgoing Diagnostics Messages #7		SP CAN #1 Baudrate	250 kBaud	
	J2497 Outgoing Diagnostics Messages #8				
	🖼 Build-in J1939-J2497 Data Mappings				
	Direct Diagnostics Routing J1939-J2497				
	- 🗺 J1939 Network				
	🖅 Constant Data List				
	Request PGN Configuration 1				
	Request PGN Configuration 2				
	Request PGN Configuration 3				
	Request PGN Configuration 4	~	<		
Ready					:50 kbit/

Figure 2: J1939 network parameters

The J1939 Network Parameters consist of *ECU Instance*, *ECU Address* and *CAN Transceiver Slew Rate* settings. Also, a custom baud rate for J1939 interface can be set (available selections include 250k, 500k and 1000k).

Note, if ECU Instance/Address parameters are changed, the Protocol Converter will restart its communication functionality. New baud rate will be taken into use at next boot up.

3.1.1 Note on J1939 network baud rate setting

The Protocol Converter device supports configurable baud rate on its J1939 interface. The new baud rate will be taken into use on next boot-up.

The AX140510 is also auto-baud rate capable. The current baud rate used by the auto-baud rate function will be shown in the *CAN #1 Baudrate* setpoint.

3.2 CAN Output Message Specification

/iew Options Help				
1939 CAN Network	Setpoint Name	Value	Comment	
• AX140510, PLC to J1939 Protocol Converter #1	SP CAN Interface	CAN Interface #1		
- i General ECU Information	SP Transmit Message PGN	0x0f000	PDU2 PGN	
Setpoint File	SP Use 11-bit ID	False		
EXP CAN Output Message #1	SP Transmit Message Enabled	No		
CAN Output Message #2	SP Transmit Trigger Source	Constant Rate		
CAN Output Message #3	SP Transmit Trigger Source Parameter	0	Not used in this mode	
E CAN Output Message #4	SP Transmission Rate	1000	[ms]	
E CAN Output Message #5	SP Transmit Message Priority	6		
🖅 CAN Output Message #6	SP Override Source Address	No		
EP CAN Output Message #7	sp Source Address	128		
CAN Output Message #8	sp Input #1 Signal Source	Not Connected		
E CAN Output Message #9	^{SP} Input #1 Data Inverted	No		
E CAN Output Message #10	sP Input #1 Byte Order	Intel		
CAN Output Message #11	SP Input #1 Two's Complement Data	No		
GAN Output Message #12	SP Input #1 Signal Type	Undefined		
- I CAN Output Message #13 - I CAN Output Message #14	SP Input #1 Byte Position	0		
ECAN Output Message #14 Em CAN Output Message #15	SP Input #1 Bit Position	0		
EAN Output Message #15 E CAN Output Message #16	^{SP} Input #1 Data Size	1		
EXAMPLE 1 Signal #1	sP Input #1 Resolution	1	[signal units / bit]	
- E CAN Input Signal #1	SP Input #1 Offset	0	[signal units]	
BE CAN Input Signal #3	^{SP} Input #1 Maximum Value		[signal units]	
EXAMPLE Signal #3 EXAMPLE Signal #4	^{SP} Input #1 Minimum Value		[signal units]	
EXAMPLE Signal # 1 EXAMPLE Signal # 5	SP Input #2 Signal Source	Not Connected		
	SP Input #2 Data Inverted	No		

Figure 3: CAN output message definition

AX140510 supports up to 16 CAN output messages. Each message can hold up to 5 signals.

Parameter name	Value range	Comment
CAN Interface	1	Read-only
Transmit Message PGN	0x0000 – 0x3FFFF	PGN for the output message
Use 11-bit ID	No, Yes	Use 11 bit ID instead of the standard 29 bit ID (only for custom messaging!). The 11 bit ID to use is specified using the <i>Transmit Message PGN</i> setpoint.
Transmit Message Enabled	No, Yes	Disable / enable the message.
Transmit Trigger Source	Constant rate, J1939 Rx Msg reception, J2497 Rx Msg reception	Transmit triggering method to use. Constant rate is defined by the <i>Transmission Rate</i> parameter.
Transmit Trigger Source Parameter	<uint8></uint8>	In case of J1939 Rx Msg triggering, this field specifies the J1939 Rx Msg definition number (1-32) for triggering the transmission. In case of J2497 Rx Msg triggering, this field specifies the J2497 Rx Msg definition number (1-32) for triggering the transmission.
Transmission Rate	0-60000	Periodic transmission rate in milliseconds

3.2.1 Output message specific settings

Transmit Message Priority	0-7	Priority bits for the J1939 message
Override Source Address	No, Yes	Should the source address be set to a specific value (by default the protocol converter's claimed address shall be used).
Source Address	0x00 – 0xFF	The new source address to use, if above is set to '1'.

Note, if transmission rate is set to 0ms, the message is sent only on request or on a configured trigger event.

3.2.2 Output signal specific settings

Parameter name	Value range	Comment	
Signal Source	Control not used CAN Input data J2497 Input data Proprietary J2497 data Constant data	CAN Input data specifies that the data is routed from the J2497 interface, CAN data specifies the CAN input message data to use. Proprietary 497 data Constant data	
Data Inverted	No, Yes	Whether to invert data.	
Byte Order	Intel, Motorola	Intel – LSB first/little endian data, Motorola – MSB first/big endian data	
Signal Type	0-2	CAN data type: 0 – not used, 1 – discrete data, 2 – continuous data	
Byte Position	0-7	The byte position in the message data field to use for signal data.	
Bit Position	0-7	The bit position within the above byte position to use for signal data.	
Data Size	1 – 32	Width of data in bits.	
Resolution	<float></float>	Data resolution to use.	
Offset	<float></float>	Data offset to use.	
Minimum Value	<float></float>	Minimum value for data.	
Maximum Value	<float></float>	Maximum value for data.	

3.3 CAN Input Message Specification

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<u>V</u> iew <u>O</u> ptions <u>H</u> elp				
CAN Output Message #13	Setpoint Name		Comment	
E CAN Output Message #14	SP CAN Interface	CAN Interface #1		
E CAN Output Message #15	^{SP} Receive Message PGN	0x0ff00	PDU2 Proprietary PGN	
CAN Output Message #16	SP Use 11-bit ID	False		
EAN Input Signal #1	SP Receive From Specific Add	ress False		
SP CAN Input Signal #2	SP Receive Selected Address	0	Not used in this mode	
SP CAN Input Signal #3	SP Receive Auto Reset Time	0	[ms]	
GAN Input Signal #4	SP CAN Signal Type	Undefined		
- 🖅 CAN Input Signal #5	SP Data Byte Order	Intel		
- 🖅 CAN Input Signal #6	SP Two's Complement Data	False		
- 🖅 CAN Input Signal #7	^{sp} Data Byte Position	0		
- 🖅 CAN Input Signal #8	SP Data Bit Position	0		
- 🖅 CAN Input Signal #9	SP Data Size	1		
- 🖅 CAN Input Signal #10	SP Data Resolution		[signal units / bit]	
- 🖅 CAN Input Signal #11	^{SP} Data Offset		[signal units]	
- 🖅 CAN Input Signal #12	^{SP} Data Minimum Value		[signal units]	
- 🖅 CAN Input Signal #13	^{SP} Data Maximum Value			
- 🖅 CAN Input Signal #14	sr Data Maximum Value	255	[signal units]	
- 🖅 CAN Input Signal #15				
- 🖅 CAN Input Signal #16				
- 🖅 CAN Input Signal #17				
- 🖅 CAN Input Signal #18				
- 🖅 CAN Input Signal #19				
E CAN Input Signal #20				
E CAN Input Signal #21				
- 🖅 CAN Input Signal #22	~			

Figure 4: CAN input message definition

AX140510 supports up to 32 CAN input messages. Each message can hold one input signal.

Parameter name	Value range	Comment	
CAN Interface	1	Read only parameter.	
Receive Message PGN	0x0000 – 0x3FFFF	The PGN to listen to.	
Use 11-bit ID	No, Yes	Use 11 bit ID instead of the standard 29 bit ID (only for custom messaging!). The 11 bit ID to use is specified using the <i>Receive Message PGN</i> setpoint.	
Receive From Specific Address	No, Yes	Whether to match the message source address with a specific address value.	
Receive Selected Address	0x00 – 0xFF	The source address to match for this PGN, valid only if <i>Receive From Specific</i> <i>Address</i> is set to '1'.	
Receive Auto Reset Time	0 – 60000	Received data reset time in milliseconds. If set to a non-zero value, the received data is zeroed after the specified time has elapsed.	
CAN Signal Type	0-2	CAN data type: 0 – not used, 1 – discrete data, 2 – continuous data	
Data Byte Order	Intel, Motorola	Intel – LSB first/little endian data, Motorola – MSB first/big endian data	
Data Byte Position	0 – 7	The byte position in the message data field to use for signal data.	
Data Bit Position	0 – 7	The bit position within the above byte position to use for signal data.	
Data Size	1 – 32	Width of data in bits.	

UMAX140510 Protocol Converter with J1939 & J2497

Data Resolution	<float></float>	Data resolution to use.
Data Offset	<float></float>	Data offset to use.
Data Minimum Value	<float></float>	Minimum value for data.
Data Maximum Value	<float></float>	Maximum value for data.

It must be noted that in case multiple CAN Input Signals are listening the same PGN, only the last one with the same PGN will send a trigger signal to the other Protocol Converter function blocks. For example, if CAN Input Signals #1, #2 and #4 are configured to receive the same PGN, only CAN Input Signal #4 can be used as a trigger source in other Protocol Converter functions.

J1939 Diagnostics To Monitor 3.4

ew Options Help				
CAN Input Signal #30	 Setpoint Name 	Value	Comme	
CAN Input Signal #31	SP SPN #1	0x00000000	connical	
CAN Input Signal #32	SP FMI #1	32		
J1939 Diagnostics To Monitor, CAN1	^{SP} Source Address #1	255		
J1939 Outgoing Diagnostics Messages #1	SP SPN #2	0x00000000		
J1939 Outgoing Diagnostics Messages #2	SP FMI #2	32		
J1939 Outgoing Diagnostics Messages #3	^{SP} Source Address #2			
J1939 Outgoing Diagnostics Messages #4	SP SPN #3	0x00000000		
IJ1939 Outgoing Diagnostics Messages #5	SP FMI #3	32		
I1939 Outgoing Diagnostics Messages #6	^{SP} Source Address #3	255		
I1939 Outgoing Diagnostics Messages #7	SP SPN #4	0x00000000		
J1939 Outgoing Diagnostics Messages #8	SP FMI #4	32		
I1939 Outgoing Diagnostics Messages #9	SP Source Address #4	255		
J1939 Outgoing Diagnostics Messages #10	SP SPN #5	0x00000000		
J1939 Outgoing Diagnostics Messages #11	SP FMI #5	32		
I1939 Outgoing Diagnostics Messages #12	SP Course Address #E			
I1939 Outgoing Diagnostics Messages #13	SP SPN #6	0x00000000		
I1939 Outgoing Diagnostics Messages #14		32		
I1939 Outgoing Diagnostics Messages #15	STIC ALL UC	255		
I1939 Outgoing Diagnostics Messages #16	SP SPN #7	0x00000000		
IZ497 Output Messages #1	SP FMI #7	32		
I2497 Output Messages #2		255		
I2497 Output Messages #3	SP Source Address #7			
IZ497 Output Messages #4	SP SPN #8	0x00000000		
- 58 J2497 Output Messages #5 - 58 J2497 Output Messages #6	^{SP} FMI #8 SP Source Address #8	32 255		

Figure 5: J1939 Diagnostics to monitor

Parameter name	Value range	Comment
SPN #x	0 0x7FFFF	Defined the SPN to read in from received
		DM1 messages.
FMI #x	0 32*	The FMI for the DM1 with the above
		SPN to listen.
Source Address #x	0 255**	The source address for the DM1 with the
		above SPN to listen.

* In case FMI 32 is specified, received DM1 messages with ALL FMI codes will be processed. ** In case address 255 is specified as Source address, received DM1 messages from ALL nodes will be processed.

3.5 J1939 Outgoing Diagnostics Messages #x

<u>View Options H</u> elp				
📴 🔛 🕞 - 🖼 CAN Input Signal #29	Setpoint Name	Value	Comment	
- ER CAN Input Signal #30	SP Diagnostic Enable	False		
- I CAN Input Signal #31	SP Diagnostic CAN Interface	CAN Interface #1		
- 🖼 CAN Input Signal #32	SP Diagnostic Data Source	Not Connected		
- III J1939 Diagnostics To Monitor, CAN1	SP SPN	0x00000000		
I1939 Outgoing Diagnostics Messages #1	SP FMI	0	Data Valid But Above Normal Operational Range - Most Severe Level	
- III J1939 Outgoing Diagnostics Messages #2	SP Lamp	Protect	Protect	
- III J1939 Outgoing Diagnostics Messages #3	SP Use Sticky Logic	No		
- 11939 Outgoing Diagnostics Messages #4	SP Delay Before Sending	0	[ms]	
- III J1939 Outgoing Diagnostics Messages #5				
J1939 Outgoing Diagnostics Messages #6				
- Ill J1939 Outgoing Diagnostics Messages #7	~			

Figure 6: J1939 Outgoing Diagnostics Messages definition

Parameter name	Value range	Comment
Diagnostic Enable	False, true	
Diagnostic CAN Interface	CAN Interface #1	Read only parameter
Diagnostic Data Source	Not connected,	The diagnostic data source for this
	J1939 Rx	J1939 diagnostic message.
	Diagnostics	
	116, J2497 Rx	
	Diagnostics	
	116	
SPN	00x7FFFF	The SPN to use in this diagnostic signal.
		In case this is set to 0, the SPN, FMI and
		OC values are copied over from
		Diagnostic Data Source. If this is set to a
		non-zero value, then the SPN and FMI
		are set as specified and OC is taken
		from an internal counter.
FMI	031	The FMI to use.
Lamp	03	The Lamp to use.
Use Sticky Logic	False, true	If this is set, the Diagnostic Status is not
		reset automatically. Instead a DM3
		message is needed (or power cycle).
Delay Before Sending	060000ms	The delay before the DM1 is sent after
		the diagnostic condition has become
		active.

3.6 J2497 Output Messages #x

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→ Ilease See See See See See See See See See S	Setpoint Name	Value	Comment		
■ J1939 Outgoing Diagnostics Messages #12	SP MID	170			
J1939 Outgoing Diagnostics Messages #13	SP Transmit Trigger Source	Constant Rate			
I1939 Outgoing Diagnostics Messages #14	SP Transmit Trigger Source Parameter	0	Not used in this mode		
J1939 Outgoing Diagnostics Messages #15	SP Transmission Rate	0	[ms]		
IJ1939 Outgoing Diagnostics Messages #16	SP Transmission Enabled	False			
	^{SP} Signal #1 Source	Not Connected			
I2497 Output Messages #2	SP PID #1	0			
I2497 Output Messages #3	^{SP} Signal #1 DLE Identifier #1	255			
I2497 Output Messages #4	^{SP} Signal #1 DLE Identifier #2	255			
I2497 Output Messages #5	^{sp} Signal #1 DLE Identifier #3	255			
I2497 Output Messages #6	^{sp} Signal #1 DLE Identifier #4	255			
- Ⅲ J2497 Output Messages #7	^{sp} Signal #1 Type	Unsigned 8-bit			
- 🖅 J2497 Output Messages #8	^{sp} Signal #1 Start Bit	0			
- 🖅 J2497 Output Messages #9	^{sp} Signal #1 Start Byte	0			
- SE J2497 Output Messages #10	^{sp} Signal #1 Data Resolution		[signal units / bit]		
I2497 Output Messages #11	^{sp} Signal #1 Data Offset		[signal units]		
I2497 Output Messages #12	^{SP} Signal #1 Data Minimum Value		[signal units]		
I2497 Output Messages #13	^{sp} Signal #1 Data Maximum Value		[signal units]		
BI J2497 Output Messages #14	^{sp} Signal #2 Source	Not Connected			
I2497 Output Messages #15	sp piD #2	Not Connected			
-se J2497 Output Messages #16 ✓	** FID #2	0			

Figure 7: J2497 Output Message definition

Parameter name	Value range	Comment
MID	0255	
Transmit Trigger Source	Constant rate, J1939 message reception, J2497 message reception	The message transmission event trigger source. Constant rate or message reception-based triggering.
Transmit Trigger Source Parameter	132	In case message reception-based triggering is selected, this defines the corresponding message number.
Transmission Rate	060000	In case constant rate is selected, this defines the message transmission interval in milliseconds.
Transmission Enabled	True, false	Enables the message transmission.
Signal #x Source	Not connected, J1939 Rx message 132, J2497 Rx message 132, Proprietary J2497 message, Constant data	Data source to use for this message.
PID #x	01024	The PID to use.
Signal #x DLE Identifier #1	0255	Data Link Escape / custom data. The
Signal #x DLE Identifier #2	0255	transmitted message will contain these
Signal #x DLE Identifier #3	0255	bytes if these values are configured to
Signal #x DLE Identifier #4	0255	0254.
Signal #x Type	undefined (0), uint8 (1),	Signal data type to use.

	uint16 (2), uint32 (3), sint8 (4), sint16 (5), sint32 (6), float16 (7), float32 (8), 1-bit (9), 2-bit (10), 3-bit (11), 4-bit (12)	
Signal #x Data Resolution	0(MAX FLOAT)	Data resolution to use, how many units / bit.
Signal #x Data Offset	(MIN FLOAT) (MAX FLOAT)	Data offset to use.
Signal #x Data Minimum Value	(<i>MIN FLOAT</i>) Signal Data Maximum Value	Data minimum value.
Signal #x Data Maximum Value	Signal Data Minimum Value (<i>MAX FLOAT</i>)	Data maximum value.

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<u>View</u> <u>Options</u> <u>H</u> elp						
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Image: Constraint of the state of	^	^{SP} Signal Start Bit ^{SP} Signal Start Byte ^{SP} Data Resolution	0 255 255 255 255 Unsigned 16-bit 0 0 1	Comment [signal units / bit]		
田 2497 Input Signals #1 田 2497 Input Signals #3 田 2497 Input Signals #10 田 2497 Input Signals #10 田 2497 Input Signals #11 田 2497 Input Signals #13 田 2497 Input Signals #13 田 2497 Input Signals #15 田 2497 Input Signals #16 田 2497 Input Signals #17	v	sr Data Offset sr Data Minimum Value sr Data Maximum Value	0	[signal units] [signal units] [signal units]		

Figure 8: J2497 Input Signal #1 definitions

Parameter name	Value range	Comment
MID	0255	Defines the MID to listen.
PID	01024	The PID to read in from a message with MID defined above.
Signal #x DLE Identifier #1	0255	Data Link Escape / custom data. The
Signal #x DLE Identifier #2	0255	received message needs to contain
Signal #x DLE Identifier #3	0255	matching bytes if these values are
Signal #x DLE Identifier #4	0255	configured to 0254.
Signal Type	undefined (0), uint8 (1), uint16 (2), uint32 (3), sint8 (4), sint16 (5), sint32 (6), float16 (7), float32 (8), 1-bit (9), 2-bit (10), 3-bit (11), 4-bit (12)	Signal data type to use.
Data Resolution	0(<i>MAX FLOAT</i>)	Data resolution to use, how many units / bit.
Data Offset	(MIN FLOAT) (MAX FLOAT)	Data offset to use.
Data Minimum Value	(<i>MIN FLOAT</i>) Signal Data Maximum Value	Data minimum value.
Data Maximum Value	Signal Data Minimum Value (<i>MAX FLOAT</i>)	Data maximum value.

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- 59 J2497 Input Signals #23 - 59 J2497 Input Signals #24 - 59 J2497 Input Signals #25 - 59 J2497 Input Signals #26 - 59 J2497 Input Signals #27 - 59 J2497 Input Signals #28 - 59 J2497 Input Signals #28 - 59 J2497 Input Signals #29 - 59 J2497 Input Signals #30 - 59 J2497 Input Signals #31 - 59 J2497 Input Signals #31 - 59 J2497 Input Signals #31 - 59 J2497 Input Signals #32 - 59 J2497 Input Signals #32	 Setpoint Name SP PID #1 SP MID #1 SP PID #2 SP MID #2 SP MID #3 SP PID #3 SP PID #4 SP MID #4 SP MID #4 SP PID #5 SP MID #5 	Value 0 128 0 128 0 128 0 128 0 128 0 128	Comment		
E J2497 Outgoing Diagnostics Messages #1 E J2497 Outgoing Diagnostics Messages #2 E J2497 Outgoing Diagnostics Messages #3 E J2497 Outgoing Diagnostics Messages #4 E J2497 Outgoing Diagnostics Messages #5 E J2497 Outgoing Diagnostics Messages #6 E J2497 Outgoing Diagnostics Messages #7 E J2497 Outgoing Diagnostics Messages #7 E J2497 Outgoing Diagnostics Messages #8 E Direct Diagnostics Resulting J1939-J2497	w (m) #3 sP pID #6 sP MID #6 sP MID #7 sP MID #8 sP MID #8 sP MID #9 sP MID #9 sP MID #10	0 128 0 128 0 128 0 128 0 128 0			
Ilight billet blaghostics Kouting 31333-32437 Image and a second secon	✓ SP MID #10	128			

Figure 9: J2497 Diagnostics to Monitor definitions

Parameter name	Value range	Comment
PID #x	01024	Defines the diagnostic PID to listen from received PID194 messages.
MID #x	0255	Defines the MID for the PID194 messages to listen.

3.9 J2497 Outgoing Diagnostics Messages #x

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<u>View Options Help</u>				
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Image: Image	 Setpoint Name SP Message Enabled SP Message Enabled SP Transmission Rate SP DI #1 SP Diagnostic Data Source #1 SP Diagnostic Data Source #2 SP Diagnostic Data Source #3 SP Diagnostic Data Source #4 SP Diagnostic Data Source #4 	128 False 1000 0 Not Connected 0 Not Connected 0 Not Connected 0		
- 1 Request PGN Configuration 1				
Request PGN Configuration 2	×			

Figure 10: J2497 Outgoing Diagnostics Messages definitions

Parameter name	Value range	Comment
MID	0255	Defines the MID to use in the diagnostic
		message.
Message enabled	True, false	Enables the transmission of the
		diagnostic message.
Transmission Rate	060000	In case constant rate is selected, this
		defines the message transmission
		interval in milliseconds.
PID #x	01024	The PID to include into this diagnostic
		message.
Diagnostic Data Source #x	Not connected,	The diagnostic data source for this
	J1939 Rx	J2497 diagnostic message.
	Diagnostics	
	116	

3.10 Build-in J1939-J2497 Data Mappings

Electronic Assistant					-		\times
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■ J2497 Outgoing Diagnostics Messages #5	^	Setpoint Name	Value	Comment			
- 🖅 J2497 Outgoing Diagnostics Messages #6		SP Enable Default Data Mappings From J2497 to J1939	False				
- 🗵 J2497 Outgoing Diagnostics Messages #7		SP Override J1939 Source Address	False				
III J2497 Outgoing Diagnostics Messages #8		SP J1939 Source Address for Messages	0	Not used in this mode			
- 🕮 Build-in J1939-J2497 Data Mappings		Ŭ					
Direct Diagnostics Routing J1939-J2497							
- BE J1939 Network							
- 🗺 Constant Data List							
Request PGN Configuration 1							
Request PGN Configuration 2							
- Marken Request PGN Configuration 3							
- ER Request PGN Configuration 4							
- 527 Request PGN Configuration 5							
Request PGN Configuration 6	~						
adv		,				'50	kbi

Figure 11: Build-in J1939-J2497 Data Mappings definitions

Parameter name	Value range	Comment
Enable Default Data	False, true	Selects whether the default data
Mappings from J2497 to		mappings from J2497 to J1939 are
J1939		enabled. See section 4.3 for details.
Override J1939 Source	False, true	Enables the overriding of Source
Address		Address in the forwarded messages.
J1939 Source Address for	0255	In case Source Address override is
Messages		enabled, this sets the Source Address to
_		use.

3.11 Direct Diagnostics Routing J1939-J2497

🖲 Elec	ctronic Assistant					-	-		\times
<u>File</u> <u>V</u> ie	ew <u>O</u> ptions <u>H</u> elp								
24 🚇 (22 F								
	I2497 Outgoing Diagnostics Messages #5	^	Setpoint Name	Value	Comment				
	J2497 Outgoing Diagnostics Messages #6		SP Enable Direct Diagnostics Routing from J1939 to J2497	False					
	I2497 Outgoing Diagnostics Messages #7		SP Override J2497 MID	False					
	III J2497 Outgoing Diagnostics Messages #8		SP J2497 MID for Outgoing Messages	0	Not used in this mode				
	Build-in J1939-J2497 Data Mappings		SP Enable Direct Diagnostics Routing from J2497 to J1939	False					
	Direct Diagnostics Routing J1939-J2497		SP Override J1939 Source Address	False					
	III J1939 Network		SP J1939 Source Address for Messages	0	Not used in this mode				
	🖼 Constant Data List		sp J1939 Lamp for Messages	Protect	Protect				
	Request PGN Configuration 1		3						
	Request PGN Configuration 2								
	Request PGN Configuration 3								
	Request PGN Configuration 4								
	BE Request PGN Configuration 5								
	I Request PGN Configuration 6	~							
Ready			,					:50	kbit/

Figure 12: Direct Diagnostics Routing J1939-J2497

Parameter name	Value range	Comment
Enable Direct Diagnostics Routing from J1939 to J2497	False, true	Selects whether the direct diagnostics routing from J1939 to J2497 is enabled. See section 0 for details.
Override J2497 MID	False, true	Enables the overriding of MID in the forwarded diagnostics messages.
J2497 MID for Outgoing Messages	0255	In case MID override is enabled, the MID to use can be specified using this setpoint.
Enable Direct Diagnostics Routing from J2497 to J1939	False, true	Selects whether the direct diagnostics routing from J2497 to J1939 are enabled. See section 0 for details.
Override J1939 Source Address	False, true	Enables the overriding of Source Address in the forwarded diagnostics messages.
J1939 Source Address for Messages	0255	In case Source Address override is enabled, this sets the Source Address to use.
J1939 Lamp for Messages	0=Protect, 1=Amber, 2=Red stop, 3=Malfunction	This defines the Lamp code to use with the J2497 messages that are forwarded into J1939.

3.12 Constant Data List

🛞 Electronic Assistant				_		×
File View Options Help						
Image: Constant Data List Image: Constant Data List	SP Constant Value #1 SP Constant Value #2 SP Constant Value #3 SP Constant Value #4 SP Constant Value #5 SP Constant Value #6 SP Constant Value #7 SP Constant Value #8	Value 0 2 4 6 8 10 12 14	Comme			
Ready	, .				:50	kbit/

Figure 13: Constant Data List

Parameter name	Value range	Comment
Constant Value 1	<float></float>	User configurable constant data
Constant Value 2	<float></float>	User configurable constant data
Constant Value 3	<float></float>	User configurable constant data
Constant Value 4	<float></float>	User configurable constant data
Constant Value 5	<float></float>	User configurable constant data
Constant Value 6	<float></float>	User configurable constant data
Constant Value 7	<float></float>	User configurable constant data
Constant Value 8	<float></float>	User configurable constant data

The constant data values can be used in CAN transmit message and J2497 Message data sources. The values are user configurable to suit the application in question.

3.13 Request PGN Configuration #x

Electronic Assistant					
e <u>V</u> iew <u>O</u> ptions <u>H</u> elp					
E I 2497 Outgoing Diagnostics Messages #5	▲ Setpoint Name	Value	Comment	 	
S2497 Outgoing Diagnostics Messages #5 S3 S3 S3 S497 Outgoing Diagnostics Messages #6	^{sp} PGN #1 to request	value 0	Comment		
- 🗊 J2497 Outgoing Diagnostics Messages #7	SP PGN #1 request from SA	0			
I2497 Outgoing Diagnostics Messages #8	SP PGN #1 requested by SA	0			
- Build-in J1939-J2497 Data Mappings B Direct Diagnostics Routing J1939-J2497	^{SP} PGN #1 request interval	0	[ms]		
- 52 J1939 Network					
- 璽 Constant Data List - 逦 Request PGN Configuration 1					
Request PGN Configuration 2					
Request PGN Configuration 3					
Request PGN Configuration 4					
Request PGN Configuration 5					
Request PGN Configuration 6	~				

Tion was	A A. F	10000000		Configuration
FIGUITE	14' 8	eanest	PGIN	CODIIOUTATION
riguio		oquoot	. 0.1	Configuration

Parameter name	Value range	Comment
PGN #x to request	0x0000 – 0x3FFFF	The PGN to request
PGN #x request from SA	0255	The remote node to request the PGN from
PGN #x requested by SA	0255	The node requesting the PGN
PGN #x request interval	060000	Request interval in milliseconds

4. DATA ROUTING BETWEEN INTERFACES

4.1 J1939 Data scaling

J1939 data is stored locally in variables (of real32 type). When an J1939 input message is received, the data stored in the message is scaled and stored into the local variable using the following equations:

$$scaledValue_{Local} = (MsgData * Resolution_{I1939,RX}) + Offset_{I1939,RX}$$

The data will be limited to the range configured using min and max setpoints.

 $Data_{Local} = MinMax[MIN_{J1939,RX}, scaledValue_{Local}, MAX_{J1939,RX}]$

When building a J1939 output message, the output message functions use the local variables' (J1939/J2497) data. The data from the local storage is scaled into a J1939 output message signal using the following equations:

$$scaledValue_{J1939} = \frac{Data_{Local}}{Resolution_{J1939,TX}} - Offset_{J1939,TX}$$

The data will be limited to the range configured using min and max setpoints.

 $Data_{J1939} = \operatorname{MinMax}[MIN_{J1939,TX}, scaledValue_{J1939}, MAX_{J1939,TX}]$

As an example of J1939 to J1939 data routing and scaling, consider the following situation in which an incoming message having 4 byte data would be scaled and transmitted out as 2 byte data in another PGN.

J1939 input message:

ID: 18FF00F8, len: 8, data: 00 00 02 00 FF FF FF FF

CAN input signal parameters: signal type: 2 (continuous), data width 32, resolution: 2⁽⁻¹⁶⁾, CAN min: 0.0, CAN max: 65535.0.

CAN output signal parameters: signal type 2 (continuous), data width 16, resolution: *1.0*, CAN min: *0.0*, CAN max: *65535.0*.

The above would yield the following J1939 output message: **ID: 18FF0180, Ien: 8, data: 02 00 FF FF FF FF FF FF**

Note: When setting very small values in the EA (like the resolution 2⁻¹⁶ in the example above), the value shown on the PC screen stays at **0.000**. The value is still programmed to the protocol converter device, the EA just shows the first three decimals on the PC screen.

4.2 J2497 Data scaling

J2497 data is scaled using the Resolution and Offset parameters, like the corresponding J1939 ones. The Minimum and Maximum setpoints define the minimum and maximum limits for the scaled data. In case the result of data scaling (using resolution and offset parameters) is out of range, the value will saturate either to Minimum or Maximum setpoint value.

$$scaledValue_{J2497} = \frac{fValue}{Resolution_{J2497}} + Offset_{J2497}$$

in which fValue is the internal value of the data (received from another J2497 message or from J1939 bus).

The data will be further compared to the configured Minimum and Maximum values and saturate in case it is out of range.

 $Data_{12497} = MinMax[MIN_{12497}, scaledValue_{12497}, MAX_{12497}]$

4.3 Build-in J1939-J2497 Data Mappings

The built-in, fixed data mappings as described in Table 1: Built-in data mappings between J1939 and J2497 are available in AX140510. In order to enable these mappings, the corresponding setpoint needs to be set to 'true' in "Build-in J1939-J2497 Data Mappings" setpoint group.

Please note that currently only J2497->J1939 data mappings are implemented. Future firmware releases may contain more mappings. The built-in mappings expect to see J2497 messages sent by a Trailer ABS Controller, MID 137.

It is possible to override the J1939 Source Address (and the J2497 MID in the other data routing direction in the future AX140510 firmware releases) of the forwarded messages with a user specified value.

Name	PGN	SPN	Width	Pos.	Res.	Offset	Min	Max	PID	Res.	Offset	Min	Max
Road Speed	0xFEF1	84	16bits	2	1.0/256.0	0.0	0.0	250.996	84	0.805	0.0	0.0	205.2
Battery Voltage	0xFEF7	168	16bits	4	0.05	0.0	0.0	3212.75	168	0.05	0.0	0.0	3276.75
Trip Distance	0xFEDF	244	32bits	1	0.125	0.0	0.0	526385151.875	244	0.16	0.0	0.0	691207984.6
Total Vehicle Distance	0xFEDF	245	32bits	5	0.125	0.0	0.0	526385151.875	245	0.161	0.0	0.0	691207984.6

Table 1: Built-in data mappings between J1939 and J2497

4.4 Direct Diagnostics Routing J1939-J2497

The AX140510 can route diagnostics messages between J1939 and J2497. When forwarding diagnostics messages from J1939 to J2497 using the Direct Diagnostics Routing function, the J1939 SPN is used as J2497 diagnostic code (PID) in diagnostics message (PID 194). In order to enable the diagnostic routing functionality, the corresponding setpoint needs to be set to 'true' in "Direct Diagnostics Routing J1939-J2497" setpoint group. Please see section 3.11 for setpoint details.

In the other direction, the J2497 diagnostic code PID is used as J1939 SPN.

The FMI and OC values are forwarded as received.

It is possible to override the J1939 Source Address and J2497 MID for the forwarded diagnostics messages with a user specified value.

5. **REFLASHING INSTRUCTIONS**

The AX140510 can be upgraded with new application firmware using the **Bootloader Information** section. This section details the simple step-by-step instructions to upload new firmware provided by Axiomatic onto the unit via CAN, without requiring it to be disconnected from the J1939 network.

Note: To upgrade the firmware use Axiomatic Electronic Assistant V<TBD> or higher.

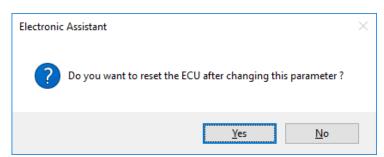
1. When the Axiomatic EA first connects to the ECU, the **Bootloader Information** section will display the following information.

- E				
J1939 CAN Network	Parameter	Value		
AX140510, PLC to J1939 Protocol Converter #1	-Hardware ID	20005		
- i General ECU Information	Hardware Revision Number	1.00		
🗄 🗐 Setpoint File	Hardware Compatibility Level	1.00		
Bootloader Information	Hardware Description	PLC-CAN-8PIN-US		
	r Bootloader ID	20005		
	Bootloader Version Number	1.00		
	Bootloader Compatibility Level	1.00		
	+Bootloader Description CAN-BOOT-J1939.ARM_STM32F4			
	+Bootloader ECU Address	253		
	 Force Bootloader to Load on Reset 	No		
	Application Firmware ID	20005		
	Application Firmware Version Number	99.99		
	Application Firmware Compatibility Level	1.00		
	Application Firmware Description	J1939-J2497 Converter		
	Application Firmware Flash File	AF-20005-99.99.bin		
	Application Firmware Flashing Date	February 17, 2021, 11:37 AM		
	Application Firmware Flashing Tool	Electronic Assistant X.XX.XXX.0, December 2020		
	Application Firmware Flashing Comments			

2. To use the bootloader to upgrade the firmware running on the ECU, change the variable **"Force Bootloader To Load on Reset**" to *Yes.*

Force Bootloader to Load on Reset Setup	×
Force Bootloader to Load on Reset: 1 - Yes	~
Default Value: 1 - Yes	Set Default
	OK Cancel

3. When the prompt box asks if you want to reset the ECU, select Yes.



4. Upon reset, the ECU will no longer show up on the J1939 network as an AX140510 but rather as **J1939 Bootloader #1**.

e <u>V</u> iew <u>Options</u> <u>H</u> elp							
2 🖾 F							
J1939 CAN Network	ECU			J1939 Preferred			
⊞ ™ J1939 Bootloader #1	***J1939 Bootloader #1 (X00FEFF0014498AAF	0XFD	Reserved for OEM			
						:50 kbi	
ectronic Assistant							
Electronic Assistant View Options Help					-		
Electronic Assistant View Options <u>H</u> elp S I F	Parameter	Value De	scription		-		it/
ady Electronic Assistant View Options Help	Parameter • FC11 Part Number	Value De	scription		-		
Electronic Assistant View Options Help 2011 FL 11939 CAN Network em 11939 Bootlader #1	ECU Part Number	AX140510	scription		-		
Electronic Assistant View Options Help 1993 CAN Network *** 11939 Boolloader #1 +1 General ECU Information			scription		_		
Electronic Assistant View Options Help Will FI 11939 CAN Network ****11939 Booldader #1	 ECU Part Number ECU Serial Number 	AX140510 0018820001		sá-hit FCU Idantifias			
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU J1939 NAME	AX140510 0018820001	N 60928.6	4-bit ECU Identifier			
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU J1939 NAME Arbitrary Address Capa	AX140510 0018820001 ble 0X00 No	N 60928. 6	4-bit ECU Identifier	sent in Address Claimed Messages		
Electronic Assistant View Options Help 1/1939 CAN Network 1/1939 Boolloader #1 1-4 General ECU Information	ECU Part Number ECU Serial Number ECU J1939 NAME Parbitrary Address Capa Industry Group	AX140510 0018820001 ble 0X00 Nc 0X00 Gld	N 60928. 6	4-bit ECU Identifier			
Electronic Assistant View Options Help 1/1939 CAN Network 1/1939 Boolloader #1 1-4 General ECU Information	ECU Part Number ECU Serial Number FECU J1939 NAME Pa/bitray Address Capa Hndustry Group Yvehide System Instance	AX140510 0018820001 bble 0X00 No 0X00 Gla e 0X00	N 60928. 6) obal				
Electronic Assistant View Options Help 1/1939 CAN Network 1/1939 Boolloader #1 1-4 General ECU Information	ECU Part Number ECU Serial Number FECU J939 NAME PArbitrary Address Capt Industry Group PVehicle System Instano PVehicle System	AX140510 0018820001 bble 0X00 No 0X00 Gla 0X00 0X7F No	N 60928. 6				
Electronic Assistant View Options Help 1/1939 CAN Network 1/1939 Boolloader #1 1-4 General ECU Information	ECU Part Number ECU Serial Number FCU Jerial Number FCU Jirga NAME FAtbitray Address Capp Hindustry Group Evelvice System Instano FVehicle System Heserved	AX140510 0018820001 bble 0X00 VG 0X00 VG 0X00 VG 0X07F VG 0X07F VG	N 60928. 6) obal ot Available				
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FECU J1939 NAME Publicas Capu Industry Group Heduks System Instance Pekicke System PReserved Frunction	AX140510 0018820001 bble 0X00 Nc 0X00 Gk 0X00 0X7F Nc 0X00 0X7F Nc	N 60928. 6) obal		sent in Address Clairned Messages		
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FacUstrary Address Capt Hindustry Group Pvehicle System Instano Pvehicle System Vehicle System Preserved Frunction Prunction Instance	AX140510 0018820001 kble 0X00 Kc 0X00 Gk 0X00 0X7F Kc 0X00 0X7F Kc 0X00	N 60928. 6 obal ot Available ot Available				
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Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU J1939 NAME E-Arbitrary Address Cape Industry Group Hindustry Group Prelicke System Instan P-Reserved FFunction Instance Houndacture Code	AX140510 0018820001 0018820001 0010820001 0010 0000 000	N 60928. 6 obal ot Available ot Available - First Inst- iomatic Tec	ance thnologies			
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FECU 11939 NAME FAbitrary Address Capue Hindustry Group Evenide System Instano Evenide System Instano Fenetion Faunction Function Function Instance HECU Instance	AX140510 0018820001 0018820001 0010820001 0010 0000 000	N 60928. 6 obal ot Available ot Available - First Inst- iomatic Tec	ance	_		
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FECU J1939 NAME H-Abitrary Address Capu Hindustry Group H-Vehicle System Instano H-Vehicle System Instano H-Reserved H-Function H-Function H-Function H-Function H-EU Instance H-Manufacturer Code Hidentity Number	AX140510 0019820001 0019820001 0000 0000 0000 0000 0000 0000 000	N 60928. 6 obbal ot Available ot Available - First Inst iomatic Tec ique ECU n	ance hnologies etwork ID number	sent in Address Claimed Messages		
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU J1939 NAME E-Arbitrary Address Cape Industry Group Hindustry Group Prelicke System Instan P-Reserved FFunction Instance Houndacture Code	AX140510 0019820001 0019820001 0000 0000 0000 0000 0000 0000 000	N 60928. 6 obal ot Available ot Available - First Inst- iomatic Tec	ance hnologies etwork ID number			
Electronic Assistant View Options Help 1939 CAN Network *** 1939 Bootloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Jigan Nume FAtbitrary Address Capp Hindustry Group Evolution System Instance FVehicle System Instance FFunction FFunction Instance FECU Instance ECU Instance ECU Address	AX140510 0018820001 ble 0000 K 0000 K 00000 K 0000 K 000 K 0000 K	N 60928. 6) obal)t Available)t Available - First Inst iomatic Tec ique ECU n served for (ance hnologies etwork ID number OEM	-		
Electronic Assistant View Options Help 1993 CAN Network *** 11939 Boolloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FECU J1939 NAME H-Abitrary Address Capu Hindustry Group H-Vehicle System Instano H-Vehicle System Instano H-Reserved H-Function H-func	AX140510 0018820001 ble 0000 K 0000 K 00000 K 0000 K 000 K 0000 K	N 60928. 6 obbal ot Available ot Available - First Inst iomatic Tec ique ECU n	ance hnologies etwork ID number OEM			
Electronic Assistant View Options Help 1993 CAN Network *** 11939 Boolloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FacU Serial Number FacU Serial Series Capa Findustry Group Evelvice System Instance Perserved Ffunction Function Instance FECU Instance Manufacturer Code *identity Number ECU Address ECU Address ECU ID	AX140510 0018820001 ble 0X00 Nc 0X00 Nc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Nc 0X00	N 60928. 6)))))))))))))))))))	ance hnologies etwork ID number DEM -ECUID	sent in Address Claimed Messages		
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Electronic Assistant View Options Help 1993 CAN Network *** 11939 Boolloader #1 +1 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FacU Serial Number FacU Serial Series Capa Findustry Group Evelvice System Instance Perserved Ffunction Function Instance FECU Instance Manufacturer Code *identity Number ECU Address ECU Address ECU ID	AX140510 0018820001 ble 0X00 Nc 0X00 Nc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Nc 0X00	N 60928. 6)))))))))))))))))))	ance hnologies etwork ID number DEM -ECUID			
Sectronic Assistant View Options Help 1939 CAN Network *** J 1939 Boolloader #1 14 General ECU Information	ECU Part Number ECU Serial Number ECU Serial Number FacU Serial Number FacU Serial Series Capa Findustry Group Evelvice System Instance Perserved Ffunction Function Instance FECU Instance Manufacturer Code *identity Number ECU Address ECU Address ECU ID	AX140510 0018820001 ble 0X00 Nc 0X00 Nc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X07 Nc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Vc 0X00 Nc 0X00	N 60928. 6)))))))))))))))))))	ance hnologies etwork ID number DEM -ECUID	sent in Address Claimed Messages		

Note that the bootloader is NOT Arbitrary Address Capable. This means that if you want to have multiple bootloaders running simultaneously (not recommended) you would have to manually change the address for each one before activating the next, or there will be address conflicts. And only one ECU would show up as the bootloader. Once the 'active' bootloader returns to regular functionality, the other ECU(s) would have to be power cycled to re-activate the bootloader feature.

5. When the **Bootloader Information** section is selected, the same information is shown as when it was running the AX140510 firmware, but in this case the <u>F</u>lashing feature has been enabled.

J1939 CAN Network	Parameter	Value	
🖙 J1939 Bootloader #1	- Hardware ID	20005	
 i General ECU Information B Bootloader Information 	+ Hardware Revision Number	1.00	
	+ Hardware Compatibility Level	1.00	
	Hardware Description	PLC-CAN-8PIN-US	
	-Bootloader ID	20005	
	Bootloader Version Number	1.00	
	Bootloader Compatibility Level	1.00	
	^L Bootloader Description	CAN-BOOT-J1939.ARM_STM32F4	
	Bootloader ECU Address	253	
	Force Bootloader to Load on Reset	Yes	
	- Application Firmware ID	20005	
	+Application Firmware Version Number	99.99	
	+Application Firmware Compatibility Level	1.00	
	+Application Firmware Description	J1939-J2497 Converter	
	Application Firmware Flash File	AF-20005-99.99.bin	
	Application Firmware Flashing Date	February 17, 2021, 11:37 AM	
	Application Firmware Flashing Tool	Electronic Assistant X.XX.XXX.0, December 2020	
	Application Firmware Flashing Comments		

6. Select the <u>F</u>lashing button and navigate to where you had saved the **AF-20005-x.xx.bin** file sent from Axiomatic. (Note: only binary (.bin) files can be flashed using the Axiomatic EA tool.)

7. Once the Flash Application Firmware window opens, you can enter comments such as "Firmware upgraded by [Name]" if you so desire. This is not required, and you can leave the field blank if you do not want to use it.

Note: You do not have to date/time-stamp the file, as the Axiomatic EA tool automatically does this when you upload the new firmware.

Flash Application Firmware	×
Flash File Name: AF-20005-99.99.bin	
Flashing Comments: Press CTRL+ENTER to add a new string	II ECU Flash Memory
Flashing Status Idle	Flash ECU
	Cancel Flashing
	Exit

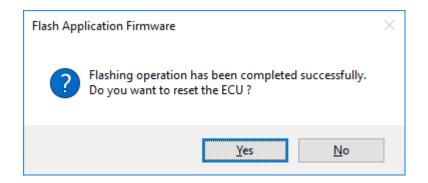


NOTE: It is good practice to tick the "Erase All ECU Flash Memory" box. Please not that selecting this option will erase ALL data stored in non-volatile flash. It will also erase any configuration of the setpoints that might have been done to the ECU and reset all setpoints to their factory defaults. In case the controller contains custom settings, those settings need to be saved to PC before reflashing.

A progress bar will show how much of the firmware has been sent as the upload progresses. The more traffic there is on the J1939 network, the longer the upload process will take.

Flash Application Firmware	X
Flash File Name:	AF-20005-99.99.bin
Flashing Comments: Press CTRL+ENTER to add a new string	
	Erase All ECU Flash Memory 🗸
Flashing Status Flashing Memory	Flash ECU
	Cancel Flashing
	Exit

Once the firmware has finished uploading, a message will pop up indicating the successful operation. If you select to reset the ECU, the new version of the AX140510 application will start running, and the ECU will be identified as such by the Axiomatic EA. Otherwise, the next time the ECU is power-cycled, the AX140510 application will run rather than the bootloader function.





Note: If at any time during the upload the process is interrupted, the data is corrupted (bad checksum) or for any other reason the new firmware is not correct, i.e. bootloader detects that the file loaded was not designed to run on the hardware platform, the bad or corrupted application will not run. Rather, when the ECU is reset or power-cycled the **J1939 Bootloader** will continue to be the default application until valid firmware has been successfully uploaded into the unit.

6. VERSION HISTORY

Revision	Date	Author	Changes	
А	19.Feb.2021	Antti Keränen	Initial version.	
-	19.Feb. 2021	A. Wilkins	Added quiescent current and auto-baud-rate	
A.1	11.Jul.2023	M Ejaz	Fixed legacy issues	
			Changed maximum operating temperature	
A.2	11.Sept.2023	Kiril Mojsov	Fixed further legacy issues	
A.3	23.January.2024	M Ejaz	Added weight	
		-	Reformatting	

APPENDIX – TECHNICAL SPECIFICATIONS

Specifications are typical at nominal input voltage and 25 degrees C unless otherwise specified.

Specifications are indicative and subject to change. Actual performance will vary depending on the application and operating conditions. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Approvals/Limitations and Return Materials Process as described on https://www.axiomatic.com/service/.

Power

Power Supply Input - Nominal	12 V or 24 Vdc nominal; 932 Vdc The minimum allowable supply voltage for the power pin is 6 Vdc.
Surge Protection	120 Vdc
Reverse Polarity Protection	Provided

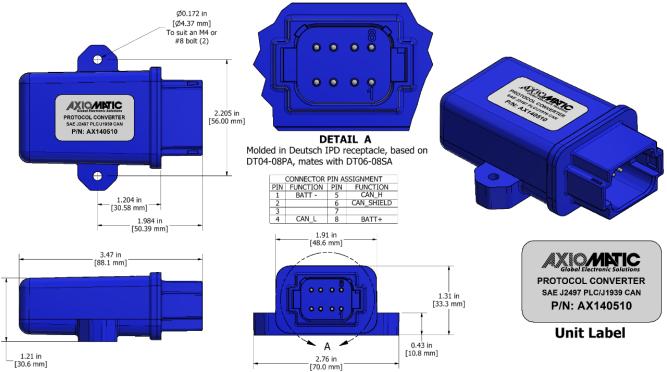
Control Logic

Software Platform AX140510 implements message conversion from SAE J2497 to SAE .	J1939.
--	--------

General Specifications

STM32F413CGU6 32-bit, 1 MByte Flash Program Memory				
1 Isolated CAN 2.0B (SAE J1939 Protocol)				
250kbit/s, 500kbit/s, 667kbit/s, 1Mbit/s. Automatic Baud Rate Detection				
300 Vrms				
SAE J2497				
Via the Axiomatic Electronic Assistant, P/Ns: AX070502, or AX070506K				
Via the Axiomatic Electronic Assistant, P/Ns: AX070502, or AX070506K				
107mA @ 12V; 65mA @ 24V Typical				
MIL-STD-202G, Method 204D test condition C (Sine)				
and Method 214A, test condition B (Random)				
10 g peak (Sine)				
7.68 Grms peak (Random)				
MIL- STD-202G, Method 213B, test condition A				
50g (half sine pulse, 9ms long, 8 per axis)				
-40 to 65°C (-40 to 149°F)				
-55 to 85°C (-67 to 185°F)				
Molded Enclosure, integral connector				
Nylon 6/6, 30% glass, ultrasonically welded				
3.47 x 2.75 x 1.31 inches (88.2 x 70.0 x 33.3 mm)				
L x W x H including integral connector				
Refer to the dimensional drawing.				

Dimensional Drawing



Electrical Connections	Integral 8-pin receptacle (equivalent TE Deutsch P/N: DT04-08PA) 18 AWG wire is recommended for use with contacts 0462-201-16141. A mating plug kit is available. Ordering P/N: AX070112 is comprised of 1 DT06-08SA, 1 W8S, 8 0462-201-16141, and 3 114017.				
	Pin #	Function			
	1 2	BATT - Not Used			
	3	Not Used			
	4	CAN_L			
	5	CAN_H			
	6	CAN_SH			
	7	Not Used			
	8	BATT +			
Weight Protection Rating	0.15 lb. (0.068 kg)				
	IP67				
Installation	Mounting holes are sized for #8 or M4 bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.425 inches (10.8 mm) thick. It should be mounted with connectors facing left or right to reduce likelihood of moisture entry. All field wiring should be suitable for the operating temperature range. Install the unit with appropriate space available for servicing and for adequate wire harness access (6 inches or 15 cm) and strain relief (12 inches or 30 cm).				



OUR PRODUCTS

AC/DC Power Supplies

Actuator Controls/Interfaces

Automotive Ethernet Interfaces

Battery Chargers

CAN Controls, Routers, Repeaters

CAN/WiFi, CAN/Bluetooth, Routers

Current/Voltage/PWM Converters

DC/DC Power Converters

Engine Temperature Scanners

Ethernet/CAN Converters, Gateways, Switches

Fan Drive Controllers

Gateways, CAN/Modbus, RS-232

Gyroscopes, Inclinometers

Hydraulic Valve Controllers

Inclinometers, Triaxial

I/O Controls

LVDT Signal Converters

Machine Controls

Modbus, RS-422, RS-485 Controls

Motor Controls, Inverters

Power Supplies, DC/DC, AC/DC

PWM Signal Converters/Isolators

Resolver Signal Conditioners

Service Tools

Signal Conditioners, Converters

Strain Gauge CAN Controls

Surge Suppressors

OUR COMPANY

Axiomatic provides electronic machine control components to the off-highway, commercial vehicle, electric vehicle, power generator set, material handling, renewable energy and industrial OEM markets. *We innovate with engineered and off-the-shelf machine controls that add value for our customers.*

QUALITY DESIGN AND MANUFACTURING

We have an ISO9001:2015 registered design/manufacturing facility in Canada.

WARRANTY, APPLICATION APPROVALS/LIMITATIONS

Axiomatic Technologies Corporation reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Approvals/Limitations and Return Materials Process at https://www.axiomatic.com/service/.

COMPLIANCE

Product compliance details can be found in the product literature and/or on axiomatic.com. Any inquiries should be sent to sales@axiomatic.com.

SAFE USE

All products should be serviced by Axiomatic. Do not open the product and perform the service yourself.



This product can expose you to chemicals which are known in the State of California, USA to cause cancer and reproductive harm. For more information go to www.P65Warnings.ca.gov.

SERVICE

All products to be returned to Axiomatic require a Return Materials Authorization Number (RMA#) from <u>rma@axiomatic.com</u>. Please provide the following information when requesting an RMA number:

- Serial number, part number
- Runtime hours, description of problem
- · Wiring set up diagram, application and other comments as needed

DISPOSAL

Axiomatic products are electronic waste. Please follow your local environmental waste and recycling laws, regulations and policies for safe disposal or recycling of electronic waste.

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