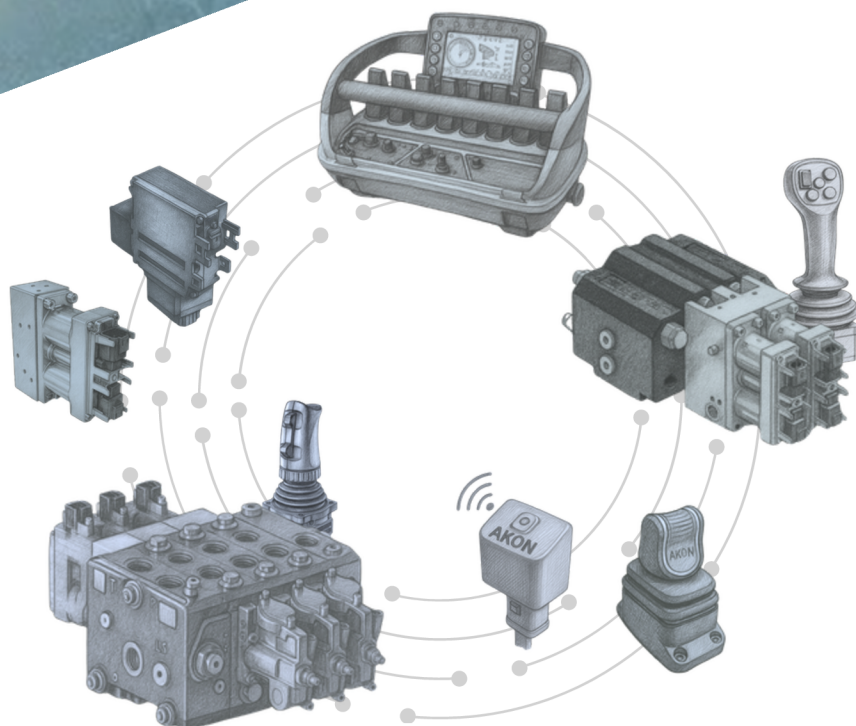




# Electronic Ecosystem



# Features

## **ACAS<sup>®</sup> Ecosystem**

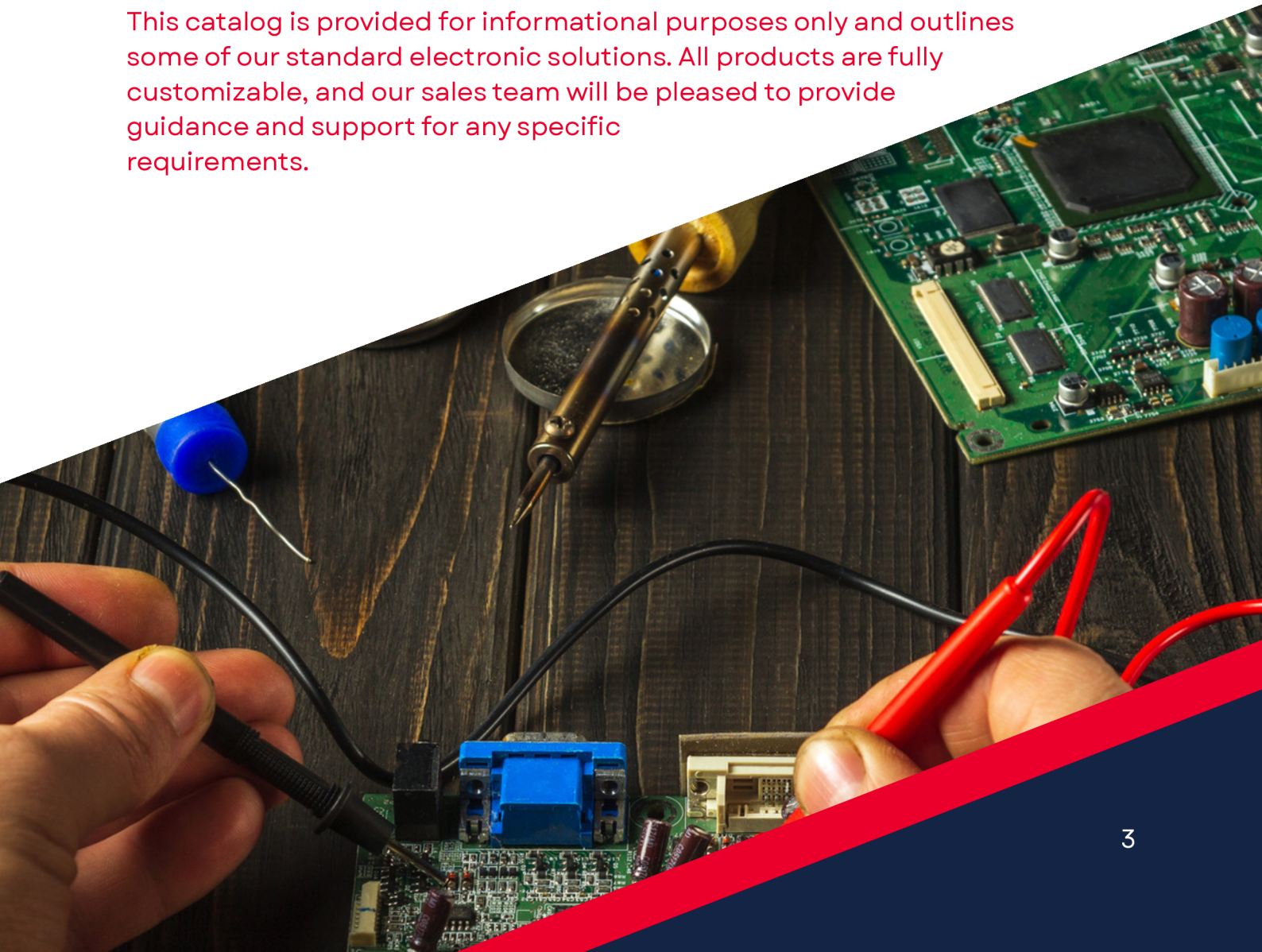
- Easy plug and play installation, reduces the risk of incorrect connections.
- Spool position sensor for extra diagnostics (hall effect).
- Faster system integration with reduced setup and calibration time,
- Optimized performance and reliability through perfectly matched electronic and hydraulic interfaces,
- Remote updates, simplified maintenance and diagnostics via smart connectivity,
- Enhanced flexibility for both OEMs and end users, enabling customized configurations for any machine architecture
- Ensures system integrity with advanced security features.

# All in one; Plug & Play

Akon Electronics offers a complete ecosystem of electronic control solutions – including valves, joysticks, electro-hydraulic actuators, electromechanical actuators, finger joysticks, radio remote controllers and WiFi-CAN modules, – all seamlessly integrated to provide plug-and-play solutions for mobile machinery.

This holistic approach transforms complex control systems into efficient, ready-to-install solutions that accelerate machine development and boost overall productivity.

This catalog is provided for informational purposes only and outlines some of our standard electronic solutions. All products are fully customizable, and our sales team will be pleased to provide guidance and support for any specific requirements.





## ACAS

Actuator that allows us to make proportional control for various applications. ACAS, SPV120, SPX80 and LVM92 valves are EHP primary components of AKON. Used to facilitate and control movement in the valve systems.



## REMOTE CONTROLLER

Remote control is generally used in mobile vehicle-mounted equipment applications with proportional hydraulic valve control in the construction and agricultural sectors.



## FINGER JOYSTICK

Finger joystick with color led feedback and electronic detent feature. CANopen, SAE J1939 and Analog (0-5V)



## JOYSTICK

coordinate joysticks that incorporates compactness and functionality. All compatible with AKON proportional valves. Directly connected and no additional controller needed.



## WIFI-CAN

WIFI-CAN controls messages on the CANBus and brings the power of IoT technology to the field. Provides real-time notifications for technical issues.



## ONE DUAL SOLENOID VALVE CONTROL CARD

This card has both analog and CAN (Controller Area Network) inputs. It provides control of a proportional valve with PWM outputs.



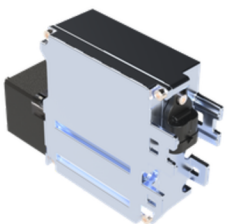
## DELOCAN

Delocan can be used to access the device information of ACAS, adjust its settings and perform software updates.



## ELECTROMECHANICAL ACTUATOR

The step motor actuator ensures fast and precise spool control with reliable positioning accuracy, eliminating the need for additional circuits and maintaining consistent performance under pressure, temperature, and viscosity variations.



# Integrated System Components



## AKON CLOSED LOOP ACTUTATOR SYSTEM

ACAS (Akon Close Loop Actuator System) is an advanced actuator system that performs position control of hydraulic valves based on the closed-loop principle.

ACAS ensures precise positioning to the target by measuring the real-time position of the valve spool and continuously monitoring this position.

In this way, high accuracy, safety, and system stability are achieved. ACAS communicates using CANopen and SAE J1939 protocols in compliance with industry standards.

It also offers control options through analog signals (0-5V, 0-10V, Ratiometric) and PWM signals.

It is designed to withstand harsh operating conditions with an IP69K protection rating.

It has successfully completed EMC and extensive electrical safety testing and is certified accordingly.

# Integrated System Components



## PROTECTION AND KEY FEATURES

### High Protection Level

Resistant to water, dust, and impacts with an IP69K protection rating.

### Electrical Protection

Reverse polarity, overvoltage, short-circuit, open-circuit, and temperature protection. EMC certification is available.

### Fast Installation

Plug and Play

### Intelligent Error Monitoring

Intelligent Error Monitoring: Fault codes and status messages are transmitted over the CAN network.

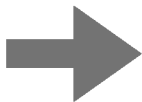
### Customizable Parameters

PID, ramp, etc.

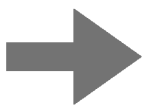
# Integrated System Components



## COVER FEATURES



**UP**



**DOWN**

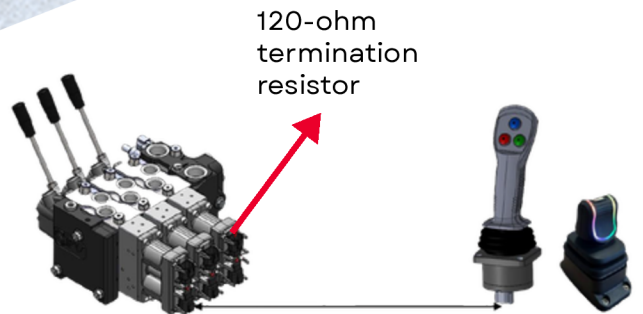
	CAN-BUS		ANALOG-VOLTAGE		PWM	
<b>UP</b>	1	VDC	1	VDC	1	VDC
	2	GND	2	GND	2	GND
	3	CAN-H	3	ALARM	3	PWM-A
	4	CAN-L	4	ANALOG INPUT	4	PWM-B
<b>DOWN</b>	1	VDC	1	MICROSWITCH-A	1	MICROSWITCH-A
	2	GND	2	MICROSWITCH-B	2	MICROSWITCH-B
	3	CAN-H	3	CAN-H	3	CAN-H
	4	CAN-L	4	CAN-L	4	CAN-L

- 1- Only the cover configuration shown above changes to enable different drive modes.
- 2- The drive mode depends on the type of cover mounted on the housing.
- 3- A laser marking on the cover indicates which configuration is active.

### The markings are as follows:

- C** - for CANbus mode
- A** for Analog mode
- R** - for Ratiometric mode
- P** - for PWM mode

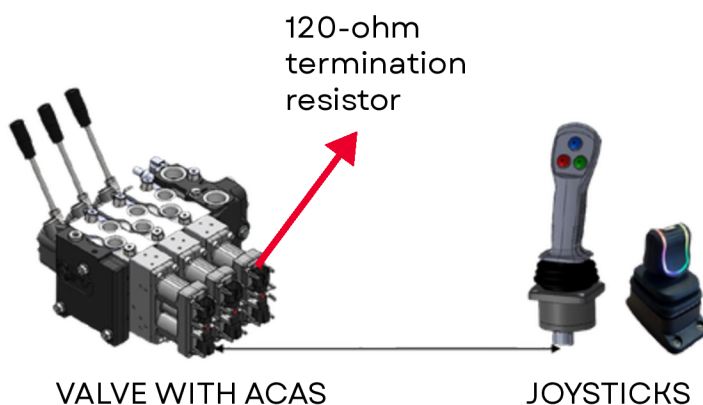
# Integrated System Components



## **ACAS** ADVANTAGES

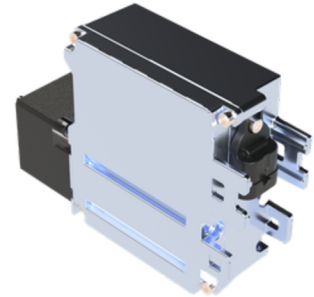
Thanks to its easy installation and plug-and-play features, ACAS offers users rapid integration and effortless commissioning. This way, you will directly experience the ease of use provided by the ACAS ecosystem.

ACAS operates without the need for an external ECU. Equipped with an advanced STM32 microcontroller, it is capable of independently managing drive operations and functioning autonomously.



ACAS units are interconnected via a daisy chain configuration, with a 120-ohm termination resistor placed at the end of the network.

# Integrated System Components



## ELECTROMECHANICAL ACTUATOR

The latest intelligent pilot control unit guarantees excellent pilot control of the main spool thanks to the high degree of precision and speed. The elimination of an additional low-pressure supply circuit, contributes not only a simplified installation process, but also ensures that the system is robust against external influences such as pressure and temperature fluctuations, viscosity, or contamination.

### Performance Data

Temperature range for normal operation	- 40 °C to + 100 °C (ambient temp. with circulating air. EMA mounted to a sectional valve)
Temperature range for reduced operation	+ 100 °C to + 120 °C (ambient temp. with circulating air. EMA mounted to a sectional valve)
Working stroke	22 mm
Speed	up to 90 mm/s
Forces	
typ. max. actuation:	315 N @ 7 A
typ. max. holding:	410 N @ 7 A
typ. dyn. start up:	410 N @ 8,5 A
Repeatability	± 16 µm
Resolution	6 µm

### Electrical Data

Voltage	12 V	24 V
Operating voltage	$U_{min} = 9 V$ $U_{max} = 16 V$	$U_{min} = 15,5 V$ $U_{max} = 33 V$
Idle current (without holding current)	80 mA	60 mA
Holding current		
Extend / Retract	~ 470 mA	500 mA
Neutral	~ 180 mA	300 mA

### Additional data

Weight	1027 g (without gear rack)
Protection class	IP6K6 / IPX9K

# Integrated System Components



## WIFI-CAN

WIFI-CAN controls messages on the CAN bus and brings the power of IoT technology to the field.

The device enables provides real-time notifications for technical issues. It is specifically designed for valve systems use ACAS and supports UNIQUE ID assignments for efficient identification.

## TECHNICAL SPECIFICATIONS

### IoT Integration

Real-time message monitoring over the CAN bus.  
Remote access and management via IoT technology.

### Real-Time Fault Notifications

Identifies which actuator within the valve system has an issue.  
Provides instant alerts for quick troubleshooting.

### Unique ID Support

Assigns a unique ID to each connected device for simplified identification and management.  
Enables efficient device tracking and communication in complex systems.

# Integrated System Components



## **CONNECTION TO ACAS WITH WIFI-CAN**

WIFI-CAN allows us to manage a canbus data from the internet. It allows us to read and write can data in acas. For this process; phone, WIFI-CAN and internet are required. The parameter changes we make when there is no internet are kept in memory. Later, when internet access is provided, the changes made are updated in the cloud. In this way, the smallest changes are recorded in the system.

# Integrated System Components



## REMOTE CONTROLLER

It can be easily used in various types of machinery such as mobile hydraulic machines, construction machines, mining machines, off-road machines, and agricultural machines.

If no operation is performed for 3 minutes, the signal range is exceeded, or the battery is removed, the system switches to emergency stop mode. All models of the remote controllers are equipped with a low battery warning LED and signal LED (the 3-minute timeout is set as default and can be adjusted according to user preference).

All models of the remote controllers can be configured with various types of joysticks, buttons, switches, selectors, and potentiometers upon request (single/double axis joystick, momentary/maintained switch, 2- or 3-position switch, 0-5 selector switch).

With the remote controller, safety and precision are at the highest level. An approval button is included for operator authorization. After operator confirmation, it checks whether the joysticks are in the start position for safety.

# Integrated System Components



## **FINGER JOYSTICK**

With its compact size, comfortable use, and colorful feedback, the finger joystick provides elegant and precise control in all your applications.

The finger joystick uses different colors for each direction and a separate color for the neutral position, enhancing ease of use in your application through clear visual feedback.

Thanks to the electronic detent feature, you can perform continuous movements without keeping your finger on the joystick by simply pressing a dedicated button.

It can be easily integrated into your system with CANopen, CANJ1939, and analog control modes.

# Integrated System Components



## JOYSTICKS

While performing axial movements with a 2-axis joystick, you can also assign various functions using the button configurations on it, allowing you to carry out any desired operation.

Enables precise axial movements through 2-axis control. Additional button configurations on the joystick allow for custom function assignments. Facilitates the execution of multiple functions simultaneously, enhancing operational efficiency and versatility. Operates over the CAN bus and can be configured to any desired device ID. Equipped with a DEADMAN function for operator and environmental safety.

The system remains inactive unless the joystick is firmly held, preventing unintended operation. Provides visual (LED indicators) and tactile (vibration) alerts when the joystick is not properly gripped. Prevents accidental movements in case of unintended contact or impact. A selector switch located on the back allows dynamic reconfiguration of all button functions on the joystick. Enables flexible operation by adapting button assignments to different functions or modes as needed.

# Integrated System Components



## **ONE DUAL SOLENOID VALVE CONTROL CARD**

In modern hydraulic and pneumatic systems, precision and flexibility are of great importance. The One Dual Solenoid Valve Control Card is a high-precision control solution designed to meet these requirements.

This card features both analog and CAN (Controller Area Network) inputs and provides PWM outputs for precise control of a proportional valve. Thanks to its M12 connectors, it offers a robust and reliable connection. It features a single-channel output, which can be configured as PWM. It provides 2A output power per channel. The CANbus communication protocol is supported, allowing the operation of valves that work with CANbus.

# Integrated System Components



## DELOCAN

The Delocan device is a single-channel high-speed CANBus - USB interface. It provides easy, robust, and versatile communication between your computer and the CANBus line.

It converts messages from the **CANBus analyzer** into the appropriate CAN communication type and sends them to the CANBus line, while also transferring the corresponding device messages from the line to the CANBus analyzer. Delocan can be used to access the device information of connected devices, adjust their settings, and perform software updates.

### HOW TO USE?

The connection between the device and the computer is established via the cable shown in the diagram. There are three connection points:

**1) USB Port:** Must be connected to the USB port of your computer.

**2) 4S Deutsch Socket (male):** Must be connected to the 4S Deutsch socket (female) of the ACAS device.

**3) External Power:** External power must be supplied (12V/24V). If all connections are made correctly, the system will be ready for data communication via the CANBus Analyzer.

# Integrated System Components



## **CONNECTING TO THE CAN LINE WITH CHAIN STRUCTURE**

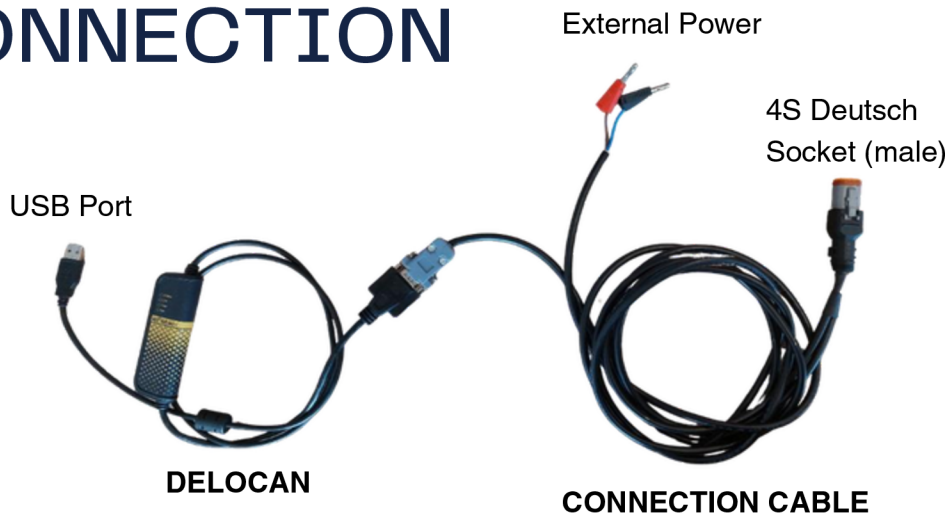
There are two connectors on the ACAS device, and in the CANbus configuration, these two connectors are the same and all pins inside the ACAS are bridged together. As shown in the diagram, the pin configuration is as follows:

- 1st pin: VCC
- 2nd pin: GND
- 3rd pin: CAN-H
- 4th pin: CAN-L

The required connections are as follows: provide positive voltage to all VCC pins in the system, provide negative voltage to all GND pins in the system, and connect all CAN-H and CAN-L pins together. To connect the ACAS devices to each other, a cable is made with both ends having a 4-way Deutsch socket. Through these cables, all pins of the ACAS devices are bridged together. Afterwards, power is supplied from any point on the power line. To prevent the CANBus from malfunctioning, 120-ohm resistor can be added to the CANBus. The appropriate CAN communication type and sends them to the CANBus line, while also transferring the corresponding device messages from the line to the CANBus analyzer. Delocan can be used to access the device information of connected devices, adjust their settings, and perform software updates.

Note: Scan the QR code on the Acas, the pin configuration changes depending on which type of cover you use.

# DELOCAN CABLE KIT CONNECTION



## CAN ANALYZER PROGRAM

On the CAN Analyzer program interface, you can view **message reading**, **message writing**, and other optional operations. Below, you can see the **program interface** and the **CAN bus messages of the connected system**.

CanBus Analyzer v.1.28 Beta

Command Device Settings Record Viewer

Port sec 250 k ACTIVE Connect USBCAN Start Record

Commands Bootloader Can FD

Bootloader

Activate Boot Mode Reset AKON VALF

Load

%0

Rolling Trace Fixed Trace Console

ID	DLC	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7	DATA8
00000000	8	00	23	00	24	78	56		
0000018D	8	86	80	87	80	80	80		
0000028D	8	F6	20	00	C8	0C	C0		
0000078D	1	05							

STATUS/CONTROL

Subindex	Name	Max	Min
	Closed Loop Control Parameters		
1	Spool-in min (µm)	2500	0
2	Spool-in max (µm)	2500	10
3	Spool-in inc_ramp (ms)	3000	1
4	Spool-in dec_ramp (ms)	3000	1
5	Spool-out min (µm)	2500	0
6	Spool-out max (µm)	2500	10
7	Spool-out inc_ramp (ms)	3000	1
8	Spool-out dec_ramp (ms)	3000	1

Download Download All CANBUS START CANBUS STOP CANBUS PREOP

# Global Availability and Remote Support





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