Electronic Control Systems Components
Catalog HY33-1800/US
North American Product Offering

ENGINEERING YOUR SUCCESS.
Task oriented controller, valve driver module
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Task oriented controller, valve driver module

**Components**

**Application**

The IQAN-TOC2 is a simple task oriented controller in the IQAN product group. This unit is designed for ease of setup, weather resistance, and safety.

The TOC2 is a general purpose unit that can control two bi-directional valve sections or two cartridge solenoids simultaneously. The IQAN-TOC2 communicates with a variety of input and output devices. It has current mode (current closed-loop) or PWM mode (voltage open-loop) output for valve control. The analog inputs accept signals from joysticks or potentiometers. Two digital inputs can be used to read switches.

The IQAN-TOC2 has a simple mechanical interface for calibration. With a preloaded personality from the factory, setup can be easily performed on the machine using a screwdriver. Adjustments possible include threshold, maximum output and slopes. The TOC2 may also be connected to a PC and programmed using IQANdevelop software to change the functionality of the controller. This advanced feature allows the TOC2 to be used in more demanding applications.

The housing is designed to be rugged, but light and has a sealed, automotive AMP junior-power timer connector. The IQAN-TOC2 has a membrane to prevent condensation inside the housing. This controller is designed for the outdoor environment.

The TOC2 is made using selected components and conforms to strict international requirements.

Diagnostics: If an error is detected an LED on the top of the controller flashes a sequence to indicate the nature of the error.

**Description**

**Ordering PN**

IQAN-TOC2 (100 hz) 5010028

Consult pricelist for other TOC2 factory preloaded personalities and their ordering part numbers.

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**General**

Weight 0.2 Kg
Operating temperature -40 to +70 °C
Protection outdoor use
Voltage supply 9 - 34 VDC
Current consumption (idle) 60 mA (28 VDC) 40 mA (14 VDC)
Data interface mechanical encoder or RS232 (using IQANdevelop)
VREF output 4.9 - 5.1 VDC 30 mA (28 VDC)

**Outputs**

Current / PWM outputs Number 2 double
Type current mode current - closed loop
PWM mode voltage - open loop
Min. threshold 50 mA
Max. load 3000 mA
Dither frequency 25 - 333 Hz
Resolution 1 mA

**Inputs**

Voltage inputs Number 2
Signal range 0 - 5 VDC
Resolution 5 mV
Digital inputs Number 2
Signal high 4 VDC - V_{BAT}
Signal low 0 - 1 VDC

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**Units=mm**
Application

The IQAN-LSL is an analog lever in the IQAN product group. This lever focuses on compact design, weather resistance and safety.

The LSL is a single-axis joystick, 0.5 - 4.5 Vdc, intended for the proportional control of one double-acting hydraulic function. The lever has several options including a manual neutral detent and a switch in the top of the handle. For 24V systems there are solenoid detent options at full stroke in the minus direction or both plus and minus directions. A solenoid detent at 75% in the B (minus) direction is also available. The LSL can be mounted in the armrest or on the dashboard in mobile vehicles. It has a comfortable grip and is easily actuated for good ergonomics.

The IQAN-LSL is lightweight with small installation dimensions. The ergonomic design assures a comfortable grip from several angles. Mounting screws are installed from underneath for a clean appearance of dashboard, panel or armrest.

The standard IQAN-LSL has an IP65 rating above the flange and the cable has a choice of either a Saab sealed AMP junior-power timer connector or a Deutsch DT series transportation connector.

The IQAN-LSL is a spring centered, dual sensor device. The optional switch in the top of the handle can be used to detect operator presence. The dual sensors provide 0.5 - 4.5 Vdc and 4.5 - 0.5 Vdc outputs which allows error checking to meet high safety requirements. All inputs and outputs are protected against short circuit to ground. The LSL is well suited as a control unit for a variety of valve drivers.

Description

Ordering PN

IQAN-LSL-E0-////-S 20011365
IQAN-LSL-E0-////-D 20014069

Consult datasheet and pricelist for IQAN-LSL detent and connector options and their ordering part numbers.
Application
The IQAN-LST is a paddle style, analog mini-lever in the IQAN product group. This lever focuses on compact design, weather resistance and safety.

The LST is a small single-axis joystick 0.5 - 4.5 Vdc, intended for the proportional control of one doubleacting hydraulic function. The combination of a mini-lever and armrest can provide substantial ergonomic benefits. The LST can be mounted in the armrest or on the dashboard in mobile vehicles. It is easily actuated with a fingertip for good ergonomics.

The IQAN-LST is lightweight with small installation dimensions. The LST also has low, well-adapted forces designed in for ease of operation in close quarters.

The lever is covered with friction rubber on either side, to prevent the fingers from slipping and to provide a comfortable feel. Mounting screws are installed from underneath for a clean appearance of the dashboard, panel or armrest.

The IQAN-LST is designed for the outdoor environment. The electronics are potted and the cable has a choice of either a Saab sealed AMP junior-power timer connector or a Deutsch DT series transportation connector. These features combine to give the LST an IP66 rating.

The IQAN-LST is a spring centered, dual sensor device. The dual sensors provide 0.5 - 4.5 Vdc and 4.5 - 0.5 Vdc outputs which allows error checking to meet high safety requirements. All inputs and outputs are protected against short circuit to ground. It is well suited as an input device for a variety of valve drivers.

### Description Ordering PN

<table>
<thead>
<tr>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>IQAN-LST-S</td>
<td>20011381</td>
</tr>
<tr>
<td>IQAN-LST-D</td>
<td>20014070</td>
</tr>
</tbody>
</table>

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**General**

- **Weight**: 0.04 Kg
- **Rated power supply (V<sub>s</sub>)**: 5 Vdc
- **Load resistive (min.)**: 4.5 kΩ
- **Load capacitive (max.)**: 1 μF
- **Current consumption**: 16 mA

**Mechanical**

- **Angle of movement**: ±30°
- **Expected life (operations)**: 5 million

**Environment**

- **Operating temperature**: -40° to 70 °C
- **Sealing**: IP66

**Analog outputs**

- **Active range (Vdc out)**: 10%-90% VS
- **Resolution**: <2mV

**Connectors**

- **-S**: Saab (AMP/Tyco JPT)
- **-D**: Deutsch DT04

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Parker Hannifin Corporation
Electronic Controls Division
Elk Grove Village, IL 60007 USA
Input devices, analog joystick

Components

Application

The IQAN-LC5-X05 is a large, coordinate joystick that incorporates ruggedness, functionality, light weight with high flexibility for mobile market applications. The unit is extremely robust, able to withstand aggressive conditions during outdoor use and in outdoor installations, including EMI, vibrations and a wide temperature range. The IQAN-LC5-X05 features a compact ergonomic design making it ideal for armrest and panel installations in mobile equipment. Fourth generation ICL4 type joysticks with N or G handles are easily replaced with the IQAN-LC5-X05.

The joystick base has an integrated Deutsch transportation connector. The handle cable may be routed completely through the non-corrosive housing. This makes field mounting of new handles, or replacing a bellow, very easy to accomplish.

All proportional output signals are of contactless Hall effect type with dual sensors to provide redundancy for high safety and reliability. The primary signal for each axis is 10%-90% of supply voltage. The corresponding secondary signal is 90%-10% of supply voltage.

Description

<table>
<thead>
<tr>
<th>Description</th>
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</tr>
</thead>
<tbody>
<tr>
<td>IQAN-LC5-X05-U1</td>
<td>20076317</td>
</tr>
<tr>
<td>IQAN-LC5-X05-U2</td>
<td>20076318</td>
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<tr>
<td>IQAN-LC5-X05-N2</td>
<td>20077692</td>
</tr>
<tr>
<td>IQAN-LC5-X05-N2T</td>
<td>20077695</td>
</tr>
<tr>
<td>IQAN-LC5-X05-N4</td>
<td>20077699</td>
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<tr>
<td>IQAN-LC5-X05-N4T</td>
<td>20077694</td>
</tr>
<tr>
<td>IQAN-LC5-X05-G</td>
<td>20077753</td>
</tr>
</tbody>
</table>

Consult datasheet and pricelist for other IQAN-LC5-X05 options and ordering part numbers.
Catalog HY33-1800/US
-MP handle for IQAN-LC5-X05

Input devices, analog joystick

Components

Application

The MP handle option provides a variety of control interfaces in an ergonomic, multi-function handle that comfortably fits your hand. The handle is a robust design, able to withstand heavy use in outdoor installations, including exposure to a wide range of automotive chemicals. The handle has the capability to have a maximum of 8 buttons or 2 proportional thumb wheels in the faceplate. Combinations of buttons, thumb wheels, and trigger are also possible. The MP handle will be assembled to the IQAN-LC5-X05 base, and the cables are routed through the base. The push buttons and thumb wheel are easily connected to the vehicle wire harness by a Deutsch DTM connector.

The MP handle is made to fit either the right or left hand, reducing inventory part numbers. The buttons are large, and have a nice tactile feel. The proportional thumb wheel has dual sensors providing 2 crossed outputs that may be compared in IQAN modules for safe operation.

Description

<table>
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<tr>
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<tbody>
<tr>
<td>IQAN-LC5-X05-MPB2W0T0</td>
<td>20076320</td>
</tr>
<tr>
<td>IQAN-LC5-X05-MPB2W0T1</td>
<td>20076321</td>
</tr>
<tr>
<td>IQAN-LC5-X05-MPB4W0T0</td>
<td>20076324</td>
</tr>
<tr>
<td>IQAN-LC5-X05-MPB4W0T1</td>
<td>20076325</td>
</tr>
<tr>
<td>IQAN-LC5-X05-MPB4W1T1</td>
<td>20076327</td>
</tr>
<tr>
<td>IQAN-LC5-X05-MPB8W0T1</td>
<td>20076329</td>
</tr>
</tbody>
</table>

Consult datasheet and pricelist for other IQAN-LC5-X05-MP options and ordering part numbers.

General (handle)

Weight .25 kg
Temperature range -40° to +85° C
Sealing outdoor use

Buttons/Trigger

Expected life (electrical) 0.5 million
Expected life (mechanical) 1 million
Travel 1.5 mm
Actuating force 2 - 5 Nm
Switching current (max) 400 mA, 32 VAC, resistive load

Thumb wheel

Rated power supply (Vs) 5 Vdc
Load resistive (min) 4.5 kΩ
Load capacitive (max) 1 μF
Current consumption (typ) 16 mA
Analog output active range 10%-90% Vs
Resolution < 2 mV
Angle of movement ± 25 degrees
Expected life (operations) 5 million

Connection

B0W0T1 / B2W0T0 / B2W0T1 / B4W0T0
B4W0T1 / B4W1Tx / B2W2Tx / B8W0Tx

Deutsch DTM, 6 p.
Deutsch DTM, 12 p.

MP standard faceplate configurations

-MP thumbwheel

Deflection vs. output diagram

-100% Neutral position 100% Deflection
90% Vs 50% Vs 10% Vs
Vout

Output A

Output B

units=mm
Application

The IQAN-LC6-X05 is a mini-coordinate joystick that incorporates ergonomic design with ruggedness, functionality, light weight and high flexibility for mobile market applications. The unit is designed to withstand aggressive conditions in different types of mobile equipment. The LC6 has a compact ergonomic design and small dimensions that make it ideal for armrest and panel mounting. The IQAN-LC6-X05 is designed for outdoor use. The housing and handle have potted electronics and are rated up to IP67.

The ergonomic handle has a unique, patent pending, rotary knob function that adds a fourth proportional function integrated in the handle. The design gives the user a benefit to control all joystick proportional functions without changing their grip on the handle, and makes the LC6 ideal for repetitive, precise motion control during extended periods in mobile applications. The 4th axis default fitted ring has a small diameter, however, if needed, the operator can attach a larger sized ring to provide a different grip feeling.

All proportional output signals in joystick, rocker and knob are of contactless Hall effect type with dual sensors to provide redundancy for safety and reliability. A magnet shielding technology is used to protect the joystick from external magnetic fields.

IQAN-LC6-X05 joystick redundant signals allow error checking to make it easy for the application designer to meet high safety requirements by using IQAN software. The primary signal for each axis is 10%-90% of supply voltage. The corresponding secondary signal is 90%-10% of supply voltage.

Description Ordering PN

IQAN-LC6-X05-U0 20077757
IQAN-LC6-X05-H1R1K0 20077758
IQAN-LC5-X05-H1R1K1 20077759
Monitoring devices, sensors

**Application**
The IQAN-SP pressure transducers belong to the family of IQAN accessories developed to complement IQAN control systems. IQAN-SP is a range of 0-5V pressure transducers for mobile hydraulic applications. These transducers are available in two pressure ranges; 35 bar (507 psi) and 500 bar (7250 psi). To make the sensors suitable for mobile equipment, we have focused upon properties such as reliability, electromagnetic immunity and ease of installation.

**Reliability**
The IQAN-SP has stainless steel construction for strength. The sensor cells use thin film technology with no internal o-rings or fluid. The high pressure capability makes the sensor very robust and able to withstand vibration.

**Electromagnetic immunity**
The design of the IQAN-SP has an EMI cap that separates the sensor electronics from the connector. This ensures a high level of EMI protection.

**Installation**
The IQAN-SP is well designed for the mobile hydraulics industry. The 3 pin connector is a sealed AMP Junior Power Timer (Bosch Jetronic) type designed for automotive use. This connector gives the sensor IP65 protection for exposed outdoor applications.

The hex of the G1/4 BSP threaded transducer has an integrated face seal to eliminate sealing washers. These features provide for easy installation and removal, even in field conditions.

**Description**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>IQAN-SP035</td>
<td>5020026</td>
</tr>
<tr>
<td>IQAN-SP500</td>
<td>5020027</td>
</tr>
</tbody>
</table>

For IQAN compatible compact pressure sensors with Deutsch connectors and SAE threads, and their ordering part numbers, consult the SCP datasheet and pricelist.

**General**
- Weight: 0.06 kg
- Operating temperature: -40 °C to 125 °C
- Storage temperature: -40 °C to 140 °C

**Pressure range**
- SP035: 0 - 35 bar
- SP500: 0 - 500 bar

**Over pressure**
- SP035: Max 100 bar
- SP500: Max 1050 bar

**Burst pressure**
- SP035: Min 150 bar
- SP500: Min 1500 bar

**Total error**
- SP035 (-40°C to 105°C): Max 4.0 % FS
- SP035 (40°C to 80°C): Max 1.0 % FS

**Response time**
- 5.0 msec

**Electrical specifications**
- Output at FS: 4.5 VDC
- Zero output: 0.5 VDC
- Supply Voltage: 5.0 ±10% VDC
- Current supply: Max 12.5 mA
- Load resistor: Min 5k ohm
- Load capacitor: Max 0.1 μF

**Threaded interface**
- With integral face seal: G1/4 BSP

**Connector**
- Integral to sensor: AMP JPT

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**Notes:**
1) Total accuracy includes non-linearity, hysteresis, repeatability and temperature effects.
2) Measured from initial value to output at 90%.
3) The output is ratiometric to supply voltage (Vs)
4) The max supply voltage with sensor operating is 6 Volt. (switch off app. 6.2 Volt)
Application
The IQAN-ST temperature transducer belongs to the family of IQAN accessories developed to complement IQAN control systems. IQAN-ST is a 0-5V output temperature transducer for mobile hydraulic applications. This transducer is available in three interface types; G1/4 BSP, M10 and 9/16”-18 UNF SAE 6. The G1/4 BSP and M10 sensors have an integral Bosch automotive connector. The SAE 6 sensor has a short cable-mounted Deutsch connector.

The IQAN-ST has stainless steel construction for strength. The PT100 sensor uses thin film technology with internal amplification. All versions of the sensor have high pressure capability. The IQAN-ST is very robust and able to withstand heavy vibrations.

The design of the IQAN-ST has an EMI cap that separates the sensor electronics from the connector. This ensures a high level of EMI protection.

The IQAN-ST is well designed for the mobile hydraulics industry. The 3 pin integral connector is a sealed AMP Junior Power Timer (Bosch Jetronic) type. The Deutsch connector is the DT04 type. Both connectors are designed for automotive use. These connectors give the sensor IP65 protection for exposed outdoor applications. The hex of the G1/4 BSP and M10 versions of the transducer have integrated face seals to eliminate loose sealing washers. The SAE 6 sensor type has a factory installed o-ring. These features provide for easy installation and removal, even in field conditions.

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>IQAN-ST-G-B</td>
<td>20073657</td>
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<tr>
<td>IQAN-ST-M-B</td>
<td>20073659</td>
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<tr>
<td>IQAN-ST-U-D</td>
<td>20073658</td>
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</table>
# Monitoring devices, sensors

## Components

### Proximity sensors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01695ECD</td>
<td>FP2000 sensor is a normally open, ferrous proximity sensor with max. .20&quot; air gap, sense zone on side. cable: 12 inches, connector: Deutsch DTM04-2P</td>
</tr>
<tr>
<td>01038ECD</td>
<td>FP2000 same as above except: sense zone on top. cable: 8 inches, connector: flying leads</td>
</tr>
<tr>
<td>01699ECD</td>
<td>FP3000 sensor is a normally open, ferrous proximity sensor with max. .40&quot; air gap. cable: 12 inches, connector: Deutsch DTM04-2P</td>
</tr>
<tr>
<td>01062ECD</td>
<td>FP3000 same as above except: normally closed, cable: 10.5 inches, connector: Deutsch DT04-4P</td>
</tr>
<tr>
<td>01778ECD</td>
<td>same as FP3000 sensor 01699 except with a vertical, adjustable mounting style case. cable: 12 inches, connector: Deutsch DTM04-2P</td>
</tr>
<tr>
<td>01703ECD</td>
<td>FP4000 sensor is a NO/NC, high power, ferrous proximity sensor with max. .25&quot; air gap. cable: 12 inches, connector: Deutsch DTM04-4P</td>
</tr>
<tr>
<td>154482ECD</td>
<td>PS65 sensor is a normally closed, magnetic proximity sensor with max. .50&quot; air gap. cable: 6 inches, connector: Deutsch DTM04-2P</td>
</tr>
<tr>
<td>01143ECD</td>
<td>A magnet target compatible with PS65 thread: 1/4&quot;-20 UNC</td>
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</table>

### Linear sensors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01710ECD</td>
<td>ADS50 sensor is a 25mm [1.0&quot;] travel, lever actuated, 0.5-4.5Vdc linear output, non-contact, analog sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P</td>
</tr>
</tbody>
</table>

### Liquid level sensors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>01913ECD</td>
<td>LF750 fuel level sensor is a 750mm length, variable resistance output, non-contact, float sensor with an aluminum tube and plastic flange. cable: 12 inches, connector: AMP Superseal 2 pos. Note: this product is in phase-out and has limited availability</td>
</tr>
<tr>
<td>01914ECD</td>
<td>LF800 fuel level sensor is same as above with 800mm length.</td>
</tr>
</tbody>
</table>
## Rotary sensors

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>01705ECD</td>
<td>RF50 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4&quot; shaft, non-contact, friction lock rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>153880ECD</td>
<td>RF55 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4&quot; shaft, non-contact, 90° friction lock rotary control. Supply: 12V, cable: 12 inches, connector: Deutsch DTM04-3P</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>153881ECD</td>
<td>RF55 rotary friction sensor is a 0.5-4.5Vdc dual output, plastic body, Ø1/4&quot; shaft, non-contact, 3 detent, rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>153882ECD</td>
<td>RF55 rotary friction sensor is a 0.5-4.5Vdc output, Ø1/4&quot; shaft, non-contact, 360° continuous rotary control. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>01707ECD</td>
<td>RS70 rotary sensor is a 0.5-4.5Vdc, dual output, 5/16&quot; hex coupling, non-contact, 170° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P</td>
<td><img src="image5.png" alt="Image" /></td>
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<tr>
<td>141453ECD</td>
<td>RS70 rotary sensor is a 0.5-4.5Vdc, dual output, 5/16&quot; hex coupling, non-contact, 100° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P</td>
<td><img src="image6.png" alt="Image" /></td>
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<tr>
<td>01708ECD</td>
<td>RS60 rotary sensor is a 0.5-4.5Vdc, dual output, Ø7/8&quot; through hole coupling, non-contact, 120° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-6P</td>
<td><img src="image7.png" alt="Image" /></td>
</tr>
<tr>
<td>01709ECD</td>
<td>RS52 rotary sensor is a 0.5-4.5Vdc, single output, non-contact, 90° rotary sensor. Supply: 5V, cable: 12 inches, connector: Deutsch DTM04-3P</td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>01825ECD</td>
<td>RS53 rotary sensor is a 0.5-4.5Vdc, single output, non-contact, 360° continuous rotary sensor. Supply: 5V, cable: 6 inches, connector: Deutsch DTM04-3P</td>
<td><img src="image9.png" alt="Image" /></td>
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# IQAN compatible Parker sensors

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<td><strong>Speed sensors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>01711ECD</strong></td>
<td>GS50 geartooth sensor is a digital output, non-contact, flange mount, ferrous sensor.</td>
</tr>
<tr>
<td></td>
<td>cable: 12 inches, connector: Deutsch DTM04-3P</td>
</tr>
<tr>
<td><strong>01712ECD</strong></td>
<td>GS60 geartooth sensor is a digital output, non-contact, threaded barrel mount, ferrous sensor.</td>
</tr>
<tr>
<td></td>
<td>cable: 12 inches, connector: Deutsch DTM04-3P</td>
</tr>
<tr>
<td><strong>154877ECD</strong></td>
<td>GS70 geartooth sensor is a digital output, non-contact, threaded mount, ferrous sensor.</td>
</tr>
<tr>
<td></td>
<td>cable: 6 inches, connector: Deutsch DT04-3P</td>
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<tr>
<td><strong>Tilt sensors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>01715ECD</strong></td>
<td>RM50 rolling magnet switch is a one axis tilt switch.</td>
</tr>
<tr>
<td></td>
<td>sensitivity: ±10 degrees</td>
</tr>
<tr>
<td></td>
<td>cable: 12 inches, connector: Deutsch DTM04-2P</td>
</tr>
<tr>
<td><strong>01716ECD</strong></td>
<td>ATS90 dual axis sensor is a two axis, 0.5-4.5Vdc, non-contact, Hall effect angle/tilt sensor.</td>
</tr>
<tr>
<td></td>
<td>Supply: 12V, range: ±10 degrees each axis, cable: 12 inches, connector: Deutsch DTM04-4P</td>
</tr>
<tr>
<td><strong>01759ECD</strong></td>
<td>ATS50 single axis sensor is a one axis, 0.5-4.5Vdc, non-contact, Hall effect angle/tilt sensor.</td>
</tr>
<tr>
<td></td>
<td>Supply: 5V, range: ±10 degrees, cable: 12 inches, connector: Deutsch DTM04-3P</td>
</tr>
<tr>
<td><strong>162703ECD</strong></td>
<td>UTS universal tilt sensor is a two axis, CANbus (J1939), non-contact, MEMS angle/tilt sensor.</td>
</tr>
<tr>
<td></td>
<td>Supply: 6.5-36Vdc, range: ±10 degrees each axis, connector: Deutsch DTM04-4P</td>
</tr>
<tr>
<td><strong>160736ECD</strong></td>
<td>UTS universal tilt sensor is a two axis, CANbus (J1939), non-contact, MEMS angle/tilt sensor.</td>
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<tr>
<td></td>
<td>Supply: 6.5-36Vdc, range: ±90 degrees each axis, connector: Deutsch DTM04-4P</td>
</tr>
<tr>
<td><strong>159456ECD</strong></td>
<td>is 3 axis version of above.</td>
</tr>
<tr>
<td><strong>Acceleration/tilt sensors</strong></td>
<td></td>
</tr>
<tr>
<td><strong>01767ECD</strong></td>
<td>ACC50 acceleration sensor is a 1.2-3.8 Vdc output accelerometer used to sense vibration, impact, tilt and motion.</td>
</tr>
<tr>
<td></td>
<td>Supply: 5V, sensitivity: ±1.5G, cable: 12 inches, connector: Deutsch DTM04-3P</td>
</tr>
<tr>
<td><strong>158904ECD</strong></td>
<td>ACC100 acceleration sensor is a 2.103-3.132 Vdc dual output accelerometer used to sense tilt and motion.</td>
</tr>
<tr>
<td></td>
<td>Supply: 5V, sensitivity: ±40°, cable: 12 inches, connector: Deutsch DTM04-6P</td>
</tr>
</tbody>
</table>
### Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Use With</th>
</tr>
</thead>
<tbody>
<tr>
<td>5031097</td>
<td>C1-connector, 4 position</td>
<td>IQAN-LST, -LSL (-S)</td>
</tr>
<tr>
<td>5031098</td>
<td>C2-connector, 2 position</td>
<td>IQAN-LSL-E1 (-S)</td>
</tr>
<tr>
<td>5031105</td>
<td>C1-connector, 16 position</td>
<td>IQAN-TOC2</td>
</tr>
<tr>
<td>20072408</td>
<td>C1-connector, DTM 6 position</td>
<td>IQAN-LC5</td>
</tr>
<tr>
<td>20077764</td>
<td>C1&amp;C2-connector, MicroFit 3.0</td>
<td>IQAN-LC6</td>
</tr>
<tr>
<td>01786ECD</td>
<td>DTM connector, 2 position</td>
<td>sensors</td>
</tr>
<tr>
<td>01787ECD</td>
<td>DTM connector, 3 position</td>
<td>sensors</td>
</tr>
<tr>
<td>01788ECD</td>
<td>DTM connector, 4 position</td>
<td>sensors</td>
</tr>
<tr>
<td>01789ECD</td>
<td>DTM connector, 6 position</td>
<td>sensors</td>
</tr>
<tr>
<td>TGSS-A</td>
<td>DTM connector, 6 position</td>
<td>sensors</td>
</tr>
<tr>
<td>0740059ECD</td>
<td>TGSS-A, 9V-16V, 0.3-44 MPH, AMP Superseal 3</td>
<td></td>
</tr>
<tr>
<td>0740078ECD</td>
<td>TGSS-A-UK, same as above, with frequency</td>
<td></td>
</tr>
<tr>
<td>0740051ECD</td>
<td>TGSS-D, 9V-16V, 0.3-44 MPH, with sensor</td>
<td></td>
</tr>
<tr>
<td>0740072ECD</td>
<td>TGSS-D-UK, same as above, with frequency</td>
<td></td>
</tr>
</tbody>
</table>

### Components

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Use With</th>
</tr>
</thead>
<tbody>
<tr>
<td>5031057</td>
<td>Pin box kit</td>
<td>AMP/Tyco pins and seals</td>
</tr>
<tr>
<td>5035003</td>
<td>Set of 3 extraction tools, stamped</td>
<td>IQAN-LST, -LSL (-S)</td>
</tr>
<tr>
<td>161116</td>
<td>Extraction tool, hardened alloy</td>
<td>IQAN-LST, -LSL (-S)</td>
</tr>
<tr>
<td>161117</td>
<td>Extraction tool, hardened alloy</td>
<td>IQAN-LST, -LSL (-S)</td>
</tr>
<tr>
<td>5030090</td>
<td>C1-cable, with seals</td>
<td>IQAN-TOC2</td>
</tr>
<tr>
<td>5030094</td>
<td>C1-cable, with seals</td>
<td>IQAN-LST, -LSL (-S)</td>
</tr>
<tr>
<td>5030095</td>
<td>C2-cable, with seals</td>
<td>IQAN-LSL-E1 (-S)</td>
</tr>
<tr>
<td>5030127</td>
<td>C1-cable, Deutsch DTM</td>
<td>IQAN-LC5</td>
</tr>
<tr>
<td>20077763</td>
<td>C1&amp;C2-cables, MicroFit 3.0</td>
<td>IQAN-LC6</td>
</tr>
<tr>
<td>5031086</td>
<td>C1-connector, 3 position</td>
<td>IQAN-SP, -ST (-B)</td>
</tr>
</tbody>
</table>

### Prototype installation cables

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Use With</th>
</tr>
</thead>
<tbody>
<tr>
<td>0740059ECD</td>
<td>TGSS-A, 9V-16V, 0.3-44 MPH, AMP Superseal 3</td>
<td></td>
</tr>
<tr>
<td>0740078ECD</td>
<td>TGSS-A-UK, same as above, with frequency</td>
<td></td>
</tr>
<tr>
<td>0740051ECD</td>
<td>TGSS-D, 9V-16V, 0.3-44 MPH, with sensor</td>
<td></td>
</tr>
<tr>
<td>0740072ECD</td>
<td>TGSS-D-UK, same as above, with frequency</td>
<td></td>
</tr>
</tbody>
</table>

Consult "IQAN accessories" datasheet and pricelist for other accessory items and ordering part numbers.
Offer of Sale

The goods, services or work (referred to as the “Products”) offered by Parker-Hannifin Corporation, its subsidiaries, groups, divisions, and authorized distributors (“Seller”) are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller’s offer by any customer (“Buyer”) is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer’s order for any Products specified in Buyer’s purchase document or Seller’s offer, proposal or quote (“Quote”) attached to the purchase document, or if no Quote is attached or if referred to in writing, shall constitute an offer and is made subject to the following conditions:

1. Terms and Conditions. Seller’s willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer’s order or any other document or other communication issued by Buyer.

2. Price. Prices quoted in Seller’s Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.O.B. Seller’s facility (INCENTS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller’s Credit Department).

3. Unpaid invoices beyond the specified payment due date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

4. Shipment, Delivery, Title and Risk of Loss. All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the shipment carrier at Seller’s facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deeming of shipment at Buyer’s request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer’s acts or omissions.

5. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are subject to a thirty (30) day limit, any claims arising as the result of the expiration of such limitation, defects, strikes, or labor disputes, acts of government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller’s reasonable control.

6. Limitation of Liability. In the event of a breach of warranty, Seller will, at its option and expense, either repair or replace a defective Product, or refund the purchase price within a reasonable period of time. In no event is Seller liable for any special, indirect, incidental or consequential damages arising out of, or as a result of, the sale, delivery, non-delivery, servicing, use or loss of use of the products or any part thereof, or for any charges or expenses of any nature incurred without Seller’s written consent, whether based in contract, tort or other legal theory. In no event shall Seller’s liability under any claim made by Buyer exceed the purchase price of the Products.

8. Loss to Buyer’s Property. Any designs, tools, patterns, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer’s property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while in Seller’s possession or control.

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller’s property notwithstanding payment of any charges by Buyer. If no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in such special tooling. If Seller shall no longer utilize such apparatus, Buyer will be entitled to return the same to Seller at Seller’s expense and option, procure for Buyer the right to continue using the Product, replace or modify any Product or any part of the Product, and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.

11. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

12. Governing Law. This agreement, and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

14. Indemnification of Intellectual Property Rights. Buyer is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights or breaches or limitations of Seller’s warranty or any other term in this agreement.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement; (b) appoints a trustee, receiver or custodian for all or any part of Buyer’s property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; (e) dissolves or, by its business or its property, becomes the subject of bankruptcy proceedings. Buyer may terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement; (b) appoints a trustee, receiver or custodian for all or any part of Seller’s property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; (e) dissolves or, by its business or its property, becomes the subject of bankruptcy proceedings.

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20. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and any other country or countries in which Buyer may operate, including without limitation the U.K. Bribery Act, the U.S. Foreign Corrupt Practices Act (“FCPA”), the U.S. Anti-Kickback Act (“Anti-Kickback Act”) and the U.S. Food Drug and Cosmetic Act (“FDCA”), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration (“FDA”), and agrees to indemnify and hold harmless Seller from the consequences of any violation of any provision of this agreement by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U.K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental or political official, any foreign governmental or political official, any foreign official or official having a public function, political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.
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Fax: 847-258-6299

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