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1 Introduction

These instructions are to be used as a reference tool for the vehicle manufacturer’s design, production, and service personnel. The user of these instructions should have basic knowledge in the handling of electronic equipment.

Safety symbols
Sections regarding safety, marked with a symbol in the left margin, must be read and understood by everyone using the system, carrying out service work or making changes to hardware and software. The different safety levels used in this manual are defined below.

**WARNING**
Sections labeled *WARNING* with a caution symbol in the left margin, indicate that a hazardous situation exists. If precautions are not taken, this could result in death, injury, or property damage.

**NOTICE**
Sections labeled *NOTICE* with a notice symbol in the left margin, indicate there is important information about the product. Ignoring this could result in less than optimal performance, or damage to the product.

Compliance with FCC
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Contains transmitter FCC ID: VPYLBZY

Contact the manufacturer if there is anything you are not sure about or if you have any questions regarding the product and its handling or maintenance. The term "manufacturer" refers to Parker Hannifin Corporation.
2 Precautions

Work on the hydraulics control electronics may only be carried out by trained personnel who are well-acquainted with the control system, the machine and its safety regulations.

**Warning**
Make sure that you have sufficient knowledge before designing, modifying or servicing the control system.
Read the relevant sections of this document before conducting any work on the control system.

**Warning**
This product is not field repairable.

**Notice**
As much as possible of the welding work on the chassis should be done before the installation of the system. If welding has to be done afterwards, the electrical connections on the system must be disconnected from other equipment. The negative cable must always be disconnected from the battery before disconnecting the positive cable. The ground wire of the welder shall be positioned as close as possible to the place of the welding. The cables on the welding unit shall never be placed near the electrical wires of the control system.

Special considerations

**Health Care**
When in a hospital or other health care facility, observe the restrictions on the use of mobiles. Switch the IQAN-G11 off, if instructed to do so by the guidelines posted in sensitive areas. Medical equipment may be sensitive to RF energy.
The operation of cardiac pacemakers, other implanted medical equipment and hearing aids can be affected by interference from IQAN-G11 antenna placed close to the device. If in doubt about potential danger, contact the physician or the manufacturer of the device to verify that the equipment is properly shielded. Pacemaker patients are advised to keep the IQAN-G11 and its antenna away from the pacemaker while it is on.

**Air traffic**
Switch off the IQAN-G11 before boarding an aircraft. Make sure it cannot be switched on inadvertently. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communications systems. Failure to observe these instructions may lead to the suspension or denial of cellular services to the offender, legal action, or both.

**Explosives**
Do not operate the IQAN-G11 in the presence of flammable gases or fumes. Switch off the IQAN-G11 when you are near petrol stations, fuel depots, chemical plants or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmospheres can constitute a safety hazard.
**Electronic equipment**

IQAN-G11 receives and transmits radio frequency energy while switched on. Remember that interference can occur if it is used close to TV sets, radios, computers or inadequately shielded equipment. Follow any special regulations and always switch off the IQAN-G11 wherever forbidden, or when you suspect that it may cause interference or danger.

**Operation**

The device must not be operated in machines and applications where life depends on the proper operation of this piece of equipment.

**Disposal**

Observe your local/national regulations when disposing the device and its package.

**Start-up, maintenance, and diagnostics**

For all personnel carrying out installation, commissioning, maintenance or troubleshooting.

**WARNING**

Work on the hydraulics control electronics may only be carried out by trained personnel who are well-acquainted with the control system, the machine and its safety regulations.

**Before you start,**

Read section "Start-up", on page 13.

**Additional information for service**

Mounting and maintenance instruction book.

**Additional information for diagnosing the system**

For information, see Appendix B, on page 16, in this document.

**NOTICE**

It is required to download the operating system 4.00 or later to enable full functionality of the IQAN-G11 in IQANdesign platform systems.
3 Quick start guide

Getting started with remote diagnostics
To use the IQAN-G11 you will also need the smartphone app, IQANsync. The IQAN-G11 can be used in either on-site or remote modes.

Tools
• IQAN-G11 bluetooth adapter hardware from Parker.
• Smart phone or tablet with internet connectivity.
• IQANsync app.
• IQANconnect service subscription (for remote diagnostics mode)

Before starting your on-site short range operations, be sure your IQAN-G11 is installed in the IQAN system and powered.

NOTICE
Refer to the User Manual, HY33-8416-UM/UK for detailed information on using the IQAN-G11 with your mobile device, the IQANsync app and IQANconnect.

IQANdesign set up for IQAN-G11 support.
To use an IQAN-G11, you must add it in the application and connect it to the diagnostic bus.

Add IQAN-G11 to diagnostics bus in IQANdesign.

Security settings for Master display units should be set up to:
• "ask user" for remote connection and remote stop

Operators can acknowledge the request for a remote diagnostics connection when it is safe and convenient.

Set security property to "ask user" to use IQAN-G11 and IQANconnect.
Security settings for Master units without a display need to be set up to:

- always allow remote connection and remote stop, or
- have a digital channel that determines when it is safe to allow a remote connection.

Without a display operators cannot acknowledge the “ask user” alternative.

Set security property to always allow use of IQAN-G11 and IQANconnect in IQANdesign.
4 Product description

General
The IQAN-G11 is a Bluetooth dongle that works with the MD4, MD3, MC4, MC3 and MC2 master modules in IQANdesign (4.00 or later) platform control systems. The IQAN-G11 is designed to transmit wireless diagnostic data from the IQAN system to a smartphone with IQANsync or a tablet with IQANrun.

System overview

The gateway module, IQAN-G11, is the wireless diagnostic unit in an IQAN system. All IQAN-G11 devices are equipped with Bluetooth.

Communication
The communication interfaces are used for uploading/downloading applications or diagnostics and typically communicate with an IQAN master module.

CAN
The IQAN-G11 has 1 CAN interface. It is located in the Deutsch DT 4 pin connector and is used to interface with IQAN master modules (e.g. IQAN-MD4).

Bluetooth
The IQAN-G11 has an embedded Bluetooth 4.0 LE (Bluetooth Smart). and is suitable for use with a smartphone with IQANsync or tablet with IQANrun.
System Diagnostics
The IQAN-G11 has 1 bi-color LED light on front surface indicating system status and dongle status.

Location of status LED.

For more information about the status and error messages, see Appendix B, on page 16.
5 Markings and approvals

Declaration of Conformity

We: Parker Hannifin Manufacturing Sweden AB
Electronic Controls Division
Located at: Mölnlycke Fabriker 14
S-435 35 Mölnlycke, SWEDEN
Tel. +46 31 750 44 00

Declare that the products identified herein comply with the essential requirements of the following EU directives:

2004/108/EC EU EMC Directive
2011/65/EU EU RoHS II Directive

Harmonized standards:
ISO 14982:2009 Agricultural and forestry machines - Electromagnetic compatibility - Test methods and acceptance criteria
EN 13309:2010 Construction machinery - Electromagnetic compatibility of machines with internal electrical power supply
EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Trade Name: Electrohydraulic Control Systems
Products: IQAN-G11

Signature of responsible party: [Signature]
Printed name of responsible party: Håkan Jisland
Position of responsible party: Operations Manager
Executed on February 23rd 2016, at Mölnlycke, Sweden
6 Mounting

Mounting the IQAN-G11
The IQAN-G11 should be mounted with the connector facing down. Fastening method is flange mounting with 2 bolts.

**NOTICE**
The IQAN-G11 module should be mounted according to the following instructions:

- Locate the module eliminating the risk for the cabling to be folded, crushed or damaged in any way. Ensure the cabling cannot pull, twist or induce sideload on the connector.
- Locate the module so that physical impact is avoided.
- Locate the module so that air can circulate to eliminate excess heat. Ensure that no external heat, e.g. from the engine or heater, is transferred to the module.
- Locate the module to protect it from pressure washing and water directly spraying on the connector or similar.
- Locate the module so the LED is visible.

![Mounting orientation of the IQAN-G11.](image)

**NOTICE**
The IQAN-G11 module must not be placed in any marine related or similar continuously damp environment without external protection.
7 Installation

Connector

Connector kit: Parker no. 5031113
Housing: DT06-4S
Wedge: W4S
Sockets: 1062-16-0122

Connector pin assignments

<table>
<thead>
<tr>
<th>Logical Symbol</th>
<th>Pin No.</th>
<th>(I)nput or (O)utput</th>
<th>Function description and/or Signal name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-BAT</td>
<td>1</td>
<td>-</td>
<td>Power supply, negative ground</td>
</tr>
<tr>
<td>+BAT</td>
<td>2</td>
<td>-</td>
<td>Power supply, positive</td>
</tr>
<tr>
<td>CAN-L</td>
<td>3</td>
<td>-</td>
<td>CAN low</td>
</tr>
<tr>
<td>CAN-H</td>
<td>4</td>
<td>-</td>
<td>CAN high</td>
</tr>
</tbody>
</table>
Supply voltage

**WARNING**
Before any installation of the IQAN system can take place, make sure the ignition lock is turned off and the battery is disconnected.

**Connecting of Supply Voltage**
The supply voltage should be within the operating range, see Appendix A, on page 14. Connect the supply voltage to +BAT, position 2 and -BAT, position 1. Protect the module by using a fuse. Requisite fuse level should be 1 A, fast (F).

**NOTICE**
Connect the dongle to the same power and ground as the IQAN master. The power supply must be common to both the dongle and the master unit to ensure trouble free communication. Most importantly, the ground connection (-BAT), must be the same.

**NOTICE**
Do not use the chassis as the negative terminal.

**Polarity reversal**
The IQAN-G11 module is protected against power supply polarity reversal, provided an external fuse, max 1 A (Fast) is being used.
If this fuse is not used, polarity reversal can damage the unit.

**NOTICE**
IQAN-G11 does not have load-dump protection and must be mounted within approx 2 meters from a unit with load-dump protection.
Communication

CAN connection
The IQAN-G11 has a **CAN interface** in its connector to communicate with IQAN master modules to provide them with remote diagnostic capabilities. The signals on the CAN connection terminals CAN-Low and CAN-High must match the signals on the CAN terminals of the connected devices.

IQAN master

![Diagram of IQAN-G11 and IQAN master connection](image)

Connecting IQAN master to IQAN-G11.

**NOTICE**
A connection will be charged against your IQANconnect subscription whenever you initiate communication with a system.
8 Start-up

Start-up procedures
This chapter contains instructions for action to be taken in connection with the initial start.

**WARNING**
Risk of injury!
If the control system is not fitted properly, the machine could move uncontrollably. The machine’s engine shall not be started before the control system is completely fitted and its signals are verified.

Starting the control system

**Start the control system as follows:**
- Prior to start, all modules and cables are to be fitted correctly.
- Check fuses, i.e. make sure that the supply voltage to the modules is equipped with the correct fuse.
- Make sure that connections for supply voltage and return lines are correct in the cable’s conductor joint.
- Make sure an emergency stop is installed. The emergency stop should disconnect the supply voltage to all modules. Alternatively, the emergency stop may also shut off the diesel engine or a dump valve, and with that, depressurize the hydraulic system.

Prepare for system start

**WARNING**
Make sure no one is in dangerous proximity to the vehicle to avoid injuries when it starts.

**Prepare for the initial system start as follows:**
- The engine for the hydraulic system’s pump shall be in off position.
- Make sure that all connectors are properly connected.
- Turn on the control system.
- Make sure that voltage is being supplied to all modules; the power/status diode shall be illuminated on all modules. Also, make sure that the master is in contact with all modules by reading the master’s display.
- Make sure the emergency stop is functioning properly.

Start the system

**Start the system as follows:**
- Start the engine for the hydraulic system’s pump, assuming that the above mentioned inspections have been carried out and shown correct values.
- Calibrate and adjust input and output signals according to the instructions related to the master menu system and check each and every output function carefully.
Appendix A

IQAN-G11 Technical Overview

Absolute Maximum Ratings\(^a\)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit values</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>min. typ. max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature, (T_{\text{AOP}})</td>
<td>– 40 +85</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature, (T_{\text{AST}})</td>
<td>– 40 +105</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Voltage supply on +BAT</td>
<td>6.5 36</td>
<td>V</td>
<td>Reverse polarity protected with 1A fuse.</td>
</tr>
<tr>
<td>Voltage on any pin with respect to -BAT</td>
<td>36</td>
<td>V</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) The “Absolute Maximum Ratings” table lists the maximum limits to which the device can be subjected without damage. **This doesn’t imply that the device will function at these extreme conditions**, only that, when these conditions are removed and the device operated within the “Recommended Operating Conditions”, it will still be functional and its useful life won’t have been shortened.

Environmental ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td></td>
</tr>
<tr>
<td>Parameter</td>
<td></td>
</tr>
<tr>
<td>EMC</td>
<td></td>
</tr>
<tr>
<td>ISO 13309:2010/ISO 14982:2009, radiated emission</td>
<td>0.15-108 MHz, Class 1</td>
</tr>
<tr>
<td>EN 55025:2008, 0.15-108 MHz, conducted emission</td>
<td>1 - 200 MHz, 1 kHz, 80% AM, 150 mA</td>
</tr>
<tr>
<td>ISO 11452-4:2005, conducted susceptibility</td>
<td>200-2000 MHz, 1kHz, 80% AM, 100 V/m</td>
</tr>
<tr>
<td>ISO 11452-2:2004, radiated susceptibility</td>
<td>800-2000 MHz, PM 577 us / 4 ms, 60 V/m</td>
</tr>
<tr>
<td>ISO 11452-2:2004, radiated susceptibility</td>
<td>Pulse 1, 2a, 2b, 3a, 3b, 4, Level 3; Pulse 5, Level 3</td>
</tr>
<tr>
<td>ISO 7637-2:2004, conducted transients susceptibility</td>
<td>Level 3</td>
</tr>
<tr>
<td>ISO 7637-3:2007, conducted transients susceptibility</td>
<td>Level 3</td>
</tr>
<tr>
<td>ESD</td>
<td></td>
</tr>
<tr>
<td>ISO 10605:2008, operation</td>
<td>15 kV, air</td>
</tr>
<tr>
<td>ISO 10605:2008, handling</td>
<td>8 kV contact</td>
</tr>
<tr>
<td>Mechanical environment</td>
<td></td>
</tr>
<tr>
<td>EN 60068-2-64:2008 Fh, randomvibration</td>
<td>15-1000 Hz, 11.6 Grms, 3x10 hours</td>
</tr>
<tr>
<td>EN 60068-2-29:1987 Eb, bump</td>
<td>40g, 6 ms, 1000 x 6 directions</td>
</tr>
<tr>
<td>Climate environment</td>
<td></td>
</tr>
<tr>
<td>IEC 60068-2-2005 Db, Damp heat cyclic</td>
<td>+55°C, 95% RH, 6 cycles</td>
</tr>
<tr>
<td>IEC 60068-2-78:2001 Cab, Damp heat steady state</td>
<td>+40°C, 93% RH, 21 days</td>
</tr>
<tr>
<td>IEC 60068-2-2:2007 Bb, Heat, operation</td>
<td>+85°C, 16 hours</td>
</tr>
<tr>
<td>IEC 60068-2-2:2007 Bb, Heat, storage</td>
<td>+105°C, 240 hours</td>
</tr>
<tr>
<td>IEC 60068-2-1:1993 Ab, Cold</td>
<td>-40°C, 16 hours</td>
</tr>
<tr>
<td>IEC 60068-2-14:1984 N, Change of temperature</td>
<td>-30°C to +55°C, 100 x 4 hours</td>
</tr>
</tbody>
</table>
## System

\[ T_a = +25 \, ^\circ C \text{ (unless otherwise specified)} \]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit values</th>
<th>Unit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>min. 60 typ. 85 max.</td>
<td>grams</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>–40 typ. +85 max.</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Voltage supply, ( V_{BAT} )</td>
<td>9 min. 32 max.</td>
<td>V</td>
<td>@14 Vdc @28 Vdc</td>
</tr>
<tr>
<td>Current consumption</td>
<td>17 min. 10 typ.</td>
<td>mA</td>
<td></td>
</tr>
</tbody>
</table>

## Approvals

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>FCC (United States)</td>
<td>FCC ID: VPYLBZY</td>
</tr>
<tr>
<td>IC (Canada)</td>
<td>IC: 772C-VPZY</td>
</tr>
<tr>
<td>CE (Europe)</td>
<td>2004/108/EC</td>
</tr>
<tr>
<td>E-mark</td>
<td>ECE regulation No. 10.05:2014, Approval number E5 10 R-05273</td>
</tr>
</tbody>
</table>

## Bluetooth

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluetooth</td>
<td>Bluetooth 4.0 LE (Bluetooth Smart)</td>
</tr>
<tr>
<td>Output power</td>
<td>0 dBm</td>
</tr>
<tr>
<td>Range Normal</td>
<td>up to 20m (in most cases 5 to 10m)</td>
</tr>
<tr>
<td>Data rate</td>
<td>up to 70 Kbit/sec</td>
</tr>
</tbody>
</table>

## CAN

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN specification</td>
<td>2.0A and 2.0B</td>
</tr>
<tr>
<td>CAN bus speed</td>
<td>100 kbit to 500 kbit</td>
</tr>
<tr>
<td>Protection</td>
<td>SCB, SCG</td>
</tr>
</tbody>
</table>
Appendix B

LED messages and actions

If an error is detected, a message will be presented on the LED.

**WARNING**

An error message could indicate that a hazardous situation exists. If precautions are not taken, this could result in death, serious injury or major property damage.

**LED indicators showing different IQAN-G11 modes**

<table>
<thead>
<tr>
<th>Status</th>
<th>Flash (yellow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Init</td>
<td>100 ms on 100 ms off</td>
</tr>
<tr>
<td>Waiting</td>
<td>100 ms on 2900 ms off</td>
</tr>
<tr>
<td>Connected</td>
<td>900 ms on 100 ms off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error code</th>
<th>Error</th>
<th>Primary Flash (red)</th>
<th>Secondary Flash (yellow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:1</td>
<td>CAN, no contact</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:4</td>
<td>CAN error (bus off)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:1</td>
<td>Internal error/OSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:2</td>
<td>Internal error/G11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C

Dimensioning of the IQAN-G11 module

Unit = mm