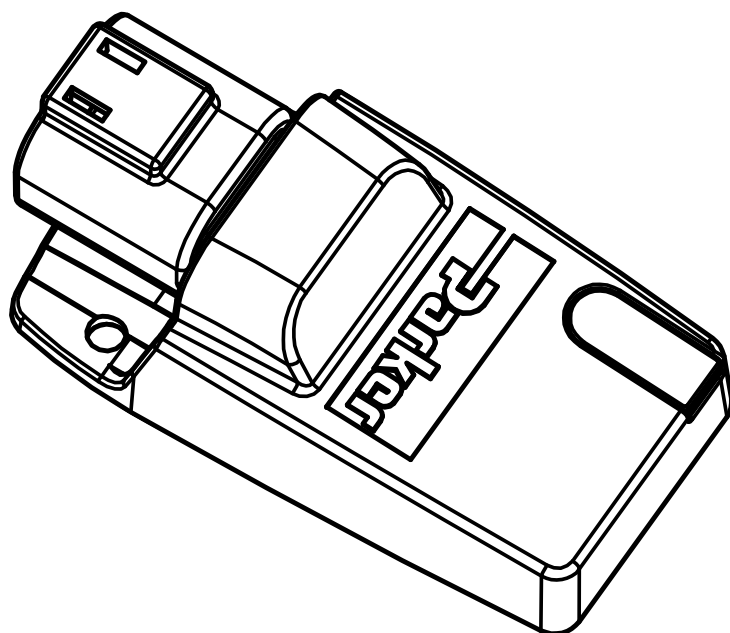


IQAN-G12

Instruction book

Publ no MSG33-8418-IB/UK

Edition 2025-06-03



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Publication history

The following table provides an overview of the changes made to this document over the course of its publication history.

Revision / date	Description of change
Rev. 001 / 2022-02-24	First edition.
Rev. 002 / 2022-03-21	Appendix A restructured and temperature range changed.
Rev. 003 / 2022-05-24	E-mark and declaration of conformity added, updated mounting recommendations and connector cover drawing added.
Rev. 004 / 2022-06-14	Appendix A system info updated.
Rev. 005 / 2024-02-12	Appendix B blink codes updated. Appendix C link to separate IQANgo user manual.
Rev. 006 / 2025-06-03	CAN FD support

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Warning

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

- This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise.
- The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.
- To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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/ISED

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE).

Contains transmitter FCC ID: QOQ-BGM220S2

IQAN-G12 complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment has very low levels of RF energy that it deemed to comply without maximum permissive exposure evaluation (MPE).

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement émet une énergie RF très faible qui est considérée conforme sans évaluation de l'exposition maximale autorisée.

Contains ISED: 5123A-BGM220S2

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.

Operation

IQAN-G12 receives and transmits radio frequency energy while switched on.

Follow any special regulations and always switch off the IQAN-G12 wherever forbidden, or when you suspect that it may cause interference or danger.

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 15.

Additional information for service

Mounting and maintenance instruction book.

Additional information for diagnosing the system

For information, see Appendix B, on page 18, in this document.



NOTICE

For use in systems with CAN FD see section "CAN FD", on page 7.

3 Quick start guide

Getting started with remote diagnostics

To use the IQAN-G12 you will also need the smartphone app, IQANgo.

The IQAN-G12 can be used in either on-site or remote modes.

Tools

- IQAN-G12 Bluetooth[®] adapter hardware from Parker.
- Smart phone or tablet with internet connectivity.
- IQANgo app, available to download from AppStore and Google Play.
- IQANconnect service subscription (for remote diagnostics mode)

Before starting your on-site short range operations, be sure your IQAN-G12 is installed in the IQAN system and powered.



NOTICE

Refer to the User Manual, Appendic C for detailed information on using the IQAN-G12 with your mobile device, the IQANgo app and IQANconnect.

Pairing IQAN-G12

The first time that a PC or App connects to the G12 Bluetooth gateway, pairing is required. For the pairing to succeed the pairing also needs to be enabled in the Bluetooth gateway module. The method for enabling pairing is configured in IQANdesign.

If pairing is required the pairing dialog will be shown, requesting a 6 digit passkey. This passkey is depending on the configuration set in IQANdesign. In systems that include an IQAN display, the passkey is shown in the master display menu system.



NOTICE

If for some reason the passkey cannot be shown in the system (e.g. a broken master display) a fall-back is to start the system without address tag for the headmaster (bypass application). This causes the Bluetooth gateway to use a passkey of 000000.

Note however that this pairing is not stored and a new pairing is required on each connection.



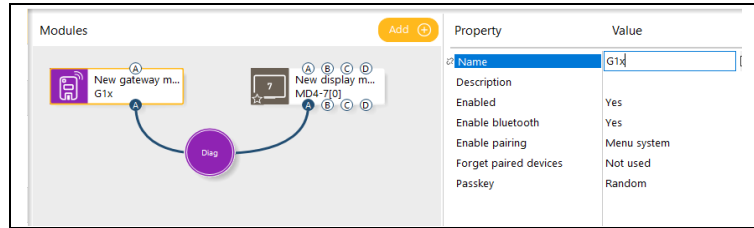
NOTICE

When connecting to a master with firmware older than 6.08 the passkey will need to be entered every time and is set to 000000.

IQANdesign set up for IQAN-G12 support.

To use IQAN-G12 specific properties it should be added as a G1x module in IQANdesign 6.08 or newer.

IQAN-G12 will work in system that support IQAN-G11 (Software from IQANdesign 4.01 and newer), with the limitation that pairing passkey is fixed at 000000 and device pairing is not stored.

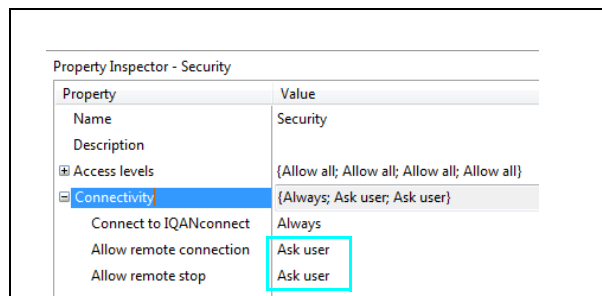


Add IQAN-G1x to diagnostics bus in IQANdesign.

Security settings for Master display units should be set up to:

- "ask user" for remote connection and remote stop

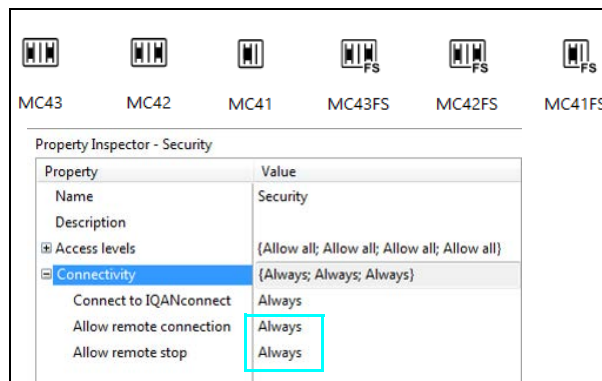
Operators can acknowledge the request for a remote diagnostics connection when it is safe and convenient.



Set security property to "ask user" to use IQAN-G12 and IQANconnect. Security settings for Master units without a display need to be set up to:

- always allow remote connection and remote stop, or
- to 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.



Security property set to "Always".



NOTICE

For security it is recommended to use an input or "Ask user" to allow a remote stop.



NOTICE

If the connected master is started in the "Bypass application" mode, it is considered to be in a safe state and is set to the "always" option until restarted.

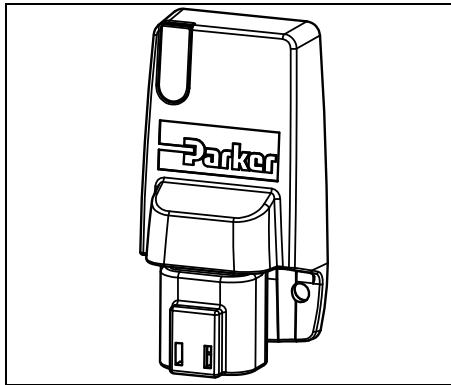
4 Product description

General

IQAN-G12 is a Bluetooth dongle that works with the MD4 and MC4 master modules in IQANdesign (6.08 or later) platform control systems. The IQAN-G12 can also be used instead of a G11 in older systems.

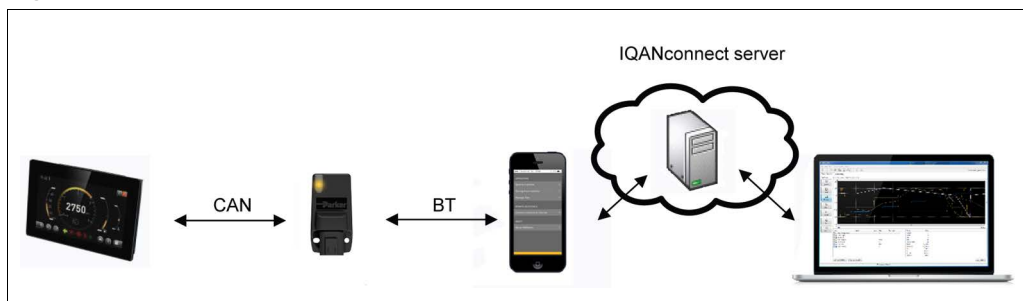
In IQANdesign 6.08 and later the G1x module represents either IQAN-G11 or IQAN-G12.

The IQAN-G1x is designed to transmit wireless diagnostic data from the IQAN system to a smartphone or tablet with IQANgo or a PC with IQANrun.



The IQAN-G12 module.

System overview



The IQAN-G12 in a typical system.

The gateway module, IQAN-G12, is the wireless diagnostic unit in an IQAN system. All IQAN-G12 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-G12 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).

CAN FD

The IQAN-G12 have the capability to use CAN FD (flexible data-rate) with speeds up to 500/2000 kbps.

Diagnostics bus speed is determined by the IQAN master modules.

Systems prior to 7.05 always use 250 kbps classic CAN.



AUTOBAUD

The IQAN-G12 supports autobaud; automatically detecting CAN bitrate on the diagnostics bus. The G12 detects bitrate on startup. If the system is updated to a different bitrate, the IQAN-G12 must be restarted.



NOTICE

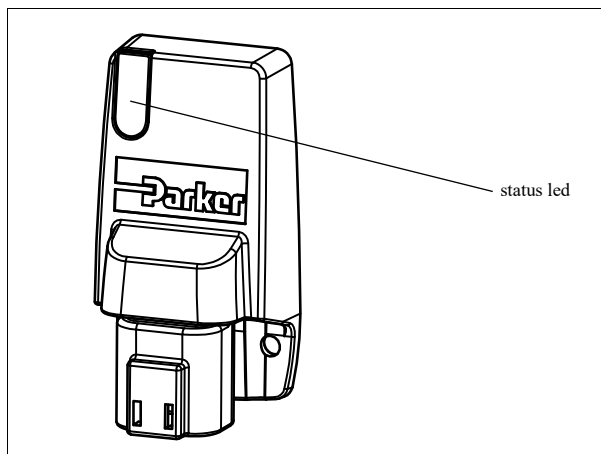
G12 software version must be updated to 2.01 or newer to use CAN FD.

Bluetooth

The IQAN-G12 has an embedded Bluetooth 5.2 low energy, and is suitable for use with a smartphone or tablet with IQANgo or PC with IQANrun.

System Diagnostics

The IQAN-G12 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 18.

5 Markings and approvals

Declaration of Conformity



EU Declaration of Conformity

We: Parker Hannifin Manufacturing Sweden AB

Located at: Bruksgatan 20
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:

2014/53/EU **Radio Equipment Directive**
2011/65/EU **EU RoHS II Directive**

Harmonized standards:

ETSI EN 300 328 v2.2.2 RF output power BLE
Occupied Channel Bandwidth BLE
Transmitter unwanted emissions in the spurious domain –
radiated BLE
EN IEC 63000:2018 Technical documentation for the assessment of electrical and
electronic products with respect to the restriction of hazardous
substances

Trade Name: Electrohydraulic Control Systems

Product: **IQAN-G12**

Signature of responsible party:

A handwritten signature in blue ink, appearing to read 'Håkan Jisland'.

Printed name of responsible party: Håkan Jisland
Position of responsible party: Business Unit Manager

Executed on May 24th 2022, at Mölnlycke, Sweden



UK Declaration of Conformity

We: Parker Hannifin Manufacturing Sweden AB

Located at: Bruksgatan 20
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 directives:

Radio Equipment Regulations 2017

Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulation 2012

Harmonized standards:

ETSI EN 300 328 v2.2.2	RF output power BLE Occupied Channel Bandwidth BLE Transmitter unwanted emissions in the spurious domain – radiated BLE
EN IEC 63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Trade Name: Electrohydraulic Control Systems

Product: IQAN-G12

Signature of responsible party:

A handwritten signature in blue ink, appearing to read 'Håkan Jisland'.

Printed name of responsible party: Håkan Jisland
Position of responsible party: Business Unit Manager

Executed on May 24th 2022, at Mölnlycke, Sweden

6 Mounting

Mounting the IQAN-G12

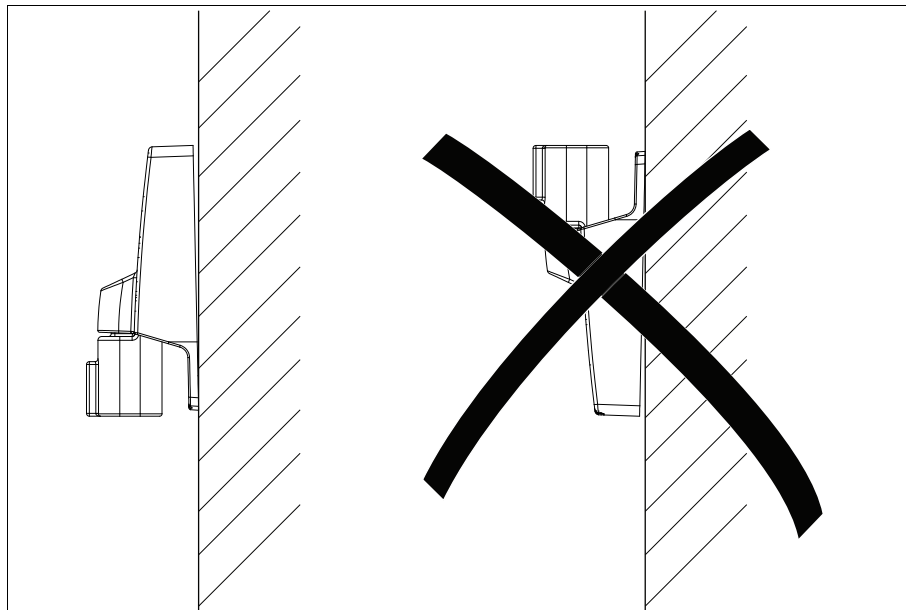
The IQAN-G12 should be mounted with the connector facing down. Fastening method is flange mounting with 2 M4 bolts.



NOTICE

The IQAN-G12 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 side load 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.
- Locate the module in a position with good signal connection while the user is in a safe position e.g. inside the cabin if available.
- Use the supplied connector cover if mounted outdoor for added protection e.g. UV radiation.

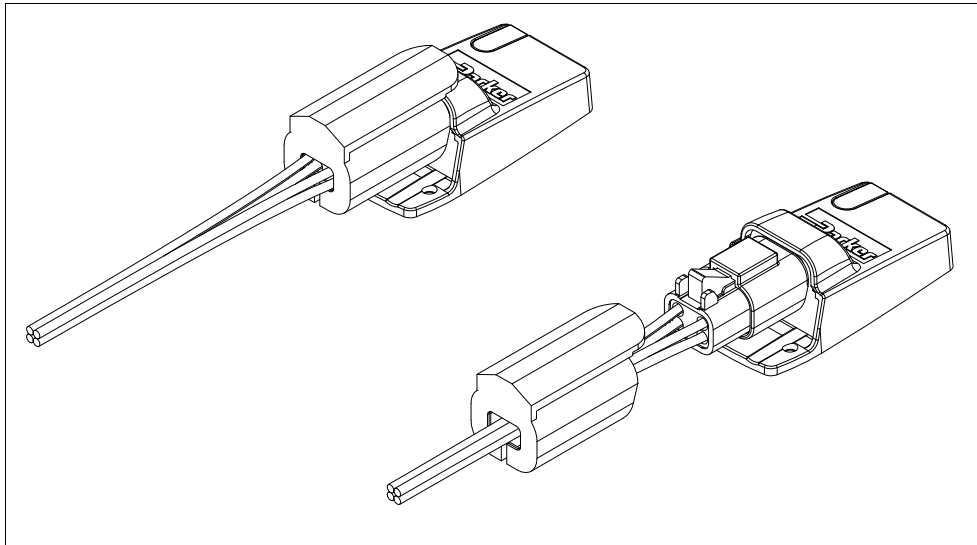


Mounting orientation of the IQAN-G12.



NOTICE

The IQAN-G12 module must not be placed in any marine related or similar continuously damp environment without external protection.

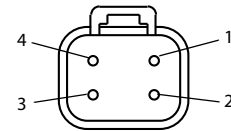


IQAN-G12 connector cover.

7 Installation

Connector

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



Connector pin assignments

Logical Symbol	Pin No.	(I)input or (O)utput	Function description and/or Signal name(s)
-BAT	1	-	Power supply, negative ground
+BAT	2	-	Power supply, positive
CAN-L	3	-	CAN low
CAN-H	4	-	CAN high

Supply voltage

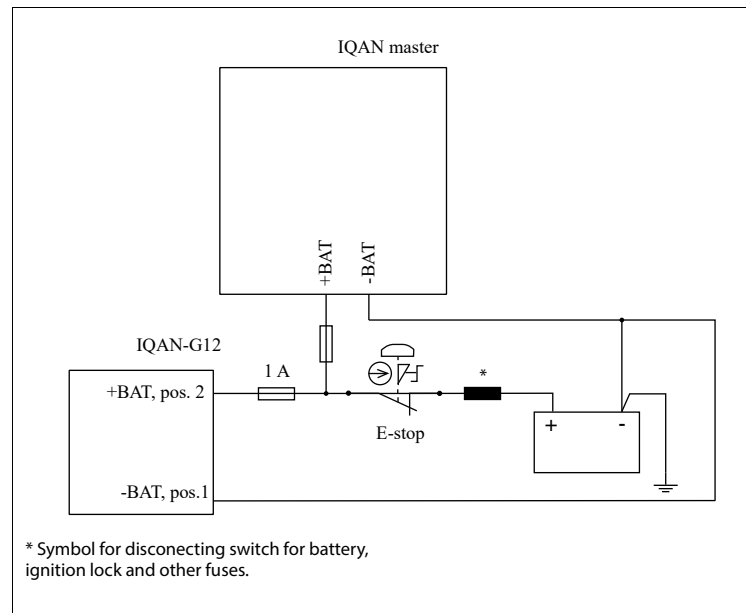


WARNING

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 16. 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).



Connecting the voltage supply.



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.



NOTICE

Unplug the connector or remove the fuse to make the IQAN-G12 powerless.

Polarity reversal

The IQAN-G12 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

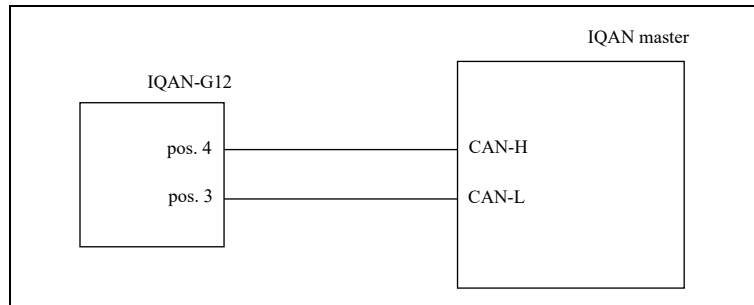
IQAN-G12 does not have load-dump protection and must be mounted within approx 2 meters from a unit with load-dump protection.

Communication

CAN connection

The IQAN-G12 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.



Connecting IQAN master to IQAN-G12.

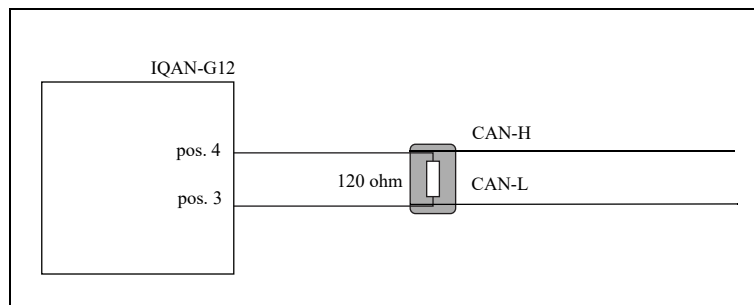


NOTICE

A connection will be charged against your IQANconnect subscription whenever you initiate communication with a system.

CAN termination

If the IQAN-G12 is located at the end of the CAN bus, it must have a termination resistor installed to terminate the bus.



Terminating IQAN master to IQAN-G12.



NOTICE

A terminating resistor of 120 ohms must be installed between the CAN-H and CAN-L pins at the IQAN-G12 if it is located at the end of the CAN bus.

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-G12 Technical Overview

System

Operating temperature	-30 to 70 °C
Absolute maximum temperature	-40 to 85 °C
Storage temperature	-40 to 85 °C
Voltage supply	12 or 24 VDC nominal voltage
Voltage range	9 to 32 V
Power-on threshold	typ 6.5 V
Over voltage on any pin	36 V (with respect to -BAT)
Reverse polarity protection on +BAT	yes
Weight	60g
Current supply VBAT = 12V VBAT = 24V	60 mA 30 mA
Start-up time	<3 sec

Environmental ratings

Climate environment Enclosure, water & dust protection Damp heat cyclic Damp heat steady state Heat, operation Heat, storage Cold Change of temperature	IEC 60529:2001, IP67; ISO 20653-2013, IP6K9K IEC 60068-2-30:2005 Db, +55°C, 95% RH, 6 cycles IEC 60068-2-78:2001, +40°C, 93% RH, 21 days IEC 60068-2-2:2007 Bb, +70°C, 72 hours IEC 60068-2-2:2007 Bb, +85°C, 240 hours IEC 60068-2-1:1993 Ab, -40°C, 16 hours IEC 60068-2-14:1984 Nb, -30°C to +70°C, 100 x 4 hours
Mechanical environment Random vibration Bumb	IEC 60068-2-64: 2008 Fh, 15 - 1000 Hz, 11.6 Grms, 3 x 10 h IEC 60068-2-27:2008 Ea, 40 g, 6 ms, 1000 * 6 dir
EMC Radiated emission Conducted emission Conducted susceptibility Radiated susceptibility Conducted transients susceptibility signal lines starting profile load dump clamped ESD, Operation ESD, Handling	EN ISO 13766-1:2018 / ISO 14982:2009 EN 55025:2017 ISO 11452-4:2011, 1 - 200 MHz, 1 kHz, 80% AM, 150 mA ISO 11452-2:2004, 200-2000 MHz, 1kHz, 80% AM, 150 V/m ISO 11452-2:2004, 800-2000 MHz, PM 577 us / 4.6 ms, 150 V/m ISO 11452-2:2004, 2000-2700 MHz, PM 577 us / 4.6 ms, 10 V/m ISO 11452-9:2012, 824 – 1910 MHz, AM, PM, 2s+2s dwell time ISO 7637-2:2011, Pulse 1, 2a, 2b, 3a, 3b, 4, Level 3 ISO 7637-3:2016, Level 3 ISO 16750-2:2012, level 4 ISO 16750-2:2012, Us=160V ISO 10605:2008, 8 kV (contact), 15 kV (air) ISO 10605:2008, 8 kV (contact)

Approvals

FCC (United States) ISED (Canada) CE (Europe)	FCC ID: QOQ-BGM220S2 ISED: 5123A-BGM220S2 2014/53/EU, Radio Directive (RED) 2011/65/EU, ROHS 2, 2015/863 RoHS 2 amendment
E-Mark	ECE regulation No. 10.06:2019, 06 series of amendments. Approval number E5 10R06/01 0507 00
Great Britain UKCA Japan MIC	Radio Equipment Regulations 2017 R209-J00429

Bluetooth

Bluetooth	Bluetooth 5.2 LE (Bluetooth Smart)
Output power	0,6 mW
Range Normal	up to 30m
Data rate	up to 2Mbit/sec (250kbps CAN is limiting this)

CAN

CAN specification	2.0B and FD
CAN bus speed	250 kbps and 500 kbps (2.0B) 500 kbps/2Mbps (CAN-FD)
Protection	SCB, SCG

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-G12 modes

Status		Flash (yellow)
Init	1000 ms on 1000 ms off	
Waiting	100 ms on 2900 ms off	
Connected	900 ms on 100 ms off	

Error code	Error	Primary Flash (red) Error category	Secondary Flash (yellow) Error description
3:4 ^a	CAN error (bus off)		
4:1 ^b	Internal error		

a. IQAN-G12 will attempt to recover automatically.

b. Followed by a longer sequence of flashes, contact Parker.

Appendix C

IQANgo

IQANgo is an app for Android and iOS that is best described as a slimmed down version of IQANrun. It has key features such as system info, log management, measure, adjust and sending and receiving files.

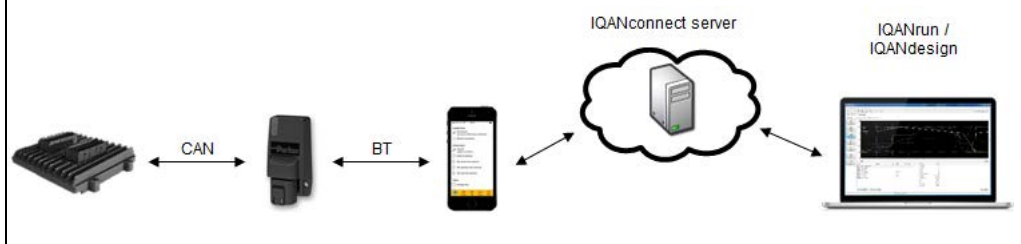
IQANgo modes together with the IQAN-G12

- **On site mode** –the IQANgo app is connected to the system via the IQAN-G12 Bluetooth gateway. The IQANgo app user performs all operations.
- **Remote assistance mode** – the IQANgo app together with the Bluetooth gateway connects the machine to internet, making the IQAN system available to remote support via the IQANconnect service. The remote user perform the operations.

On site mode



Remote assistance mode



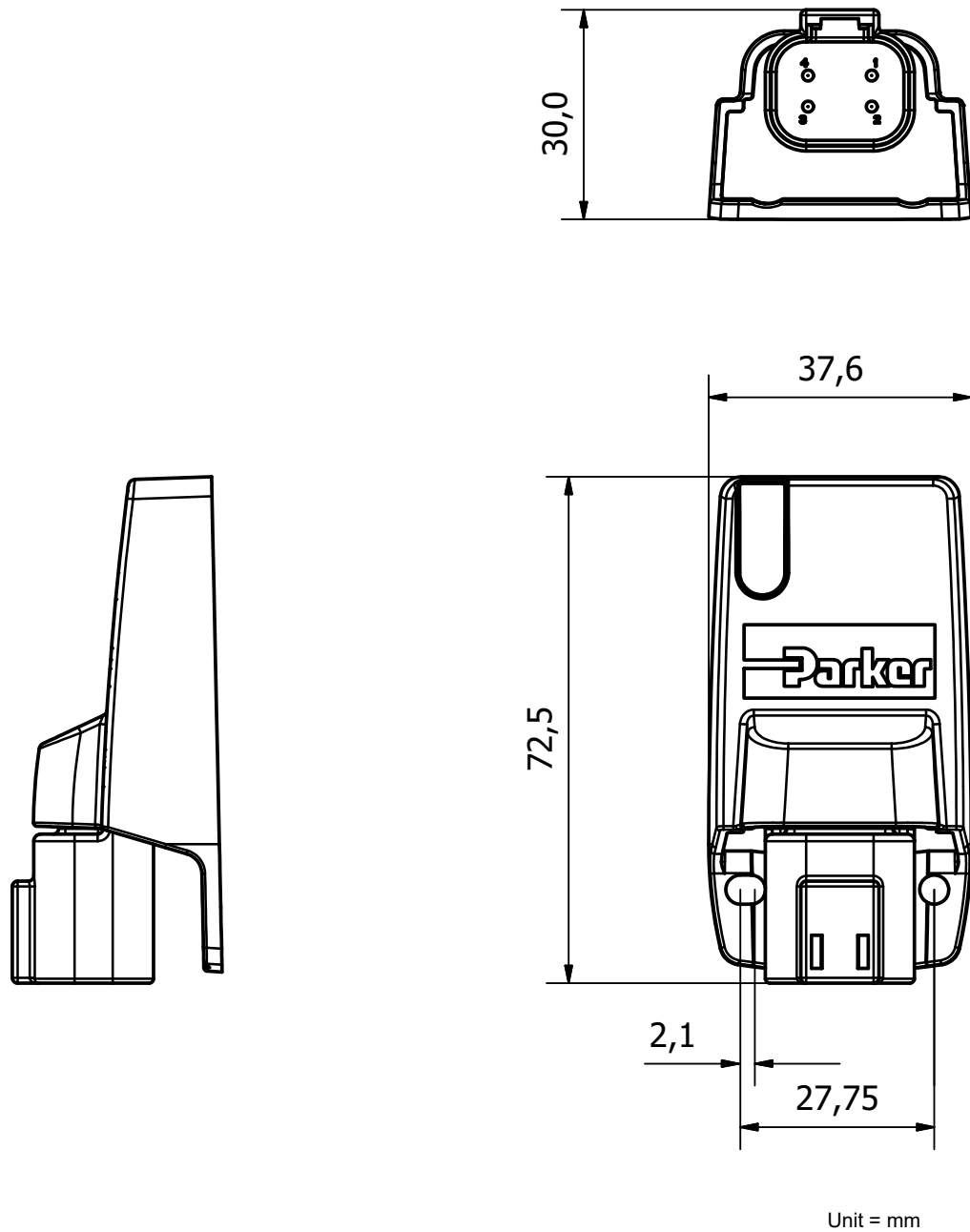
IQANgo user manual

For more information see IQANgo user manual:

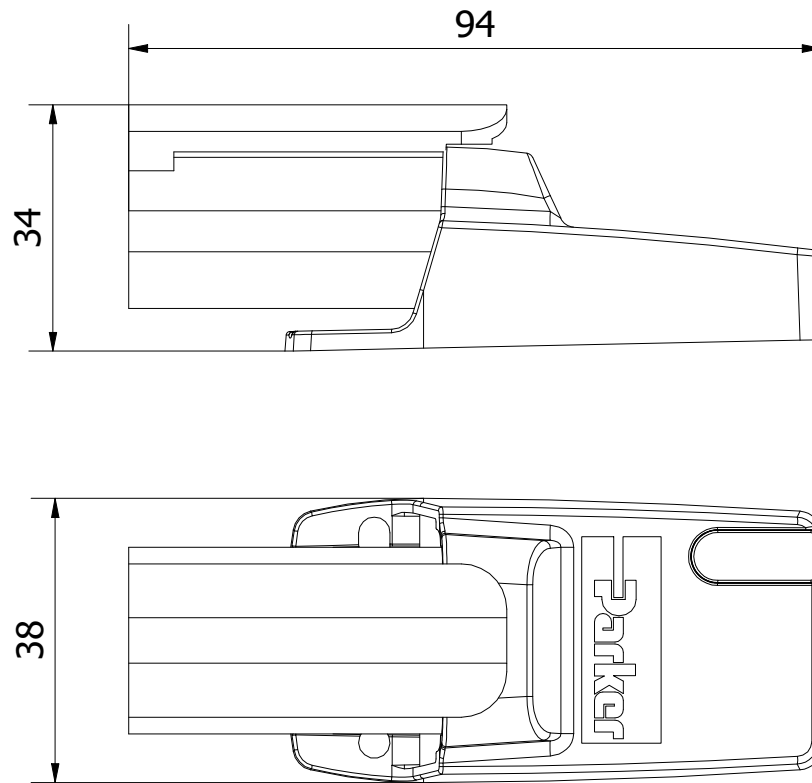
<https://www.iqan.se/doc/iqango/IQANgo.pdf>

Appendix D

Dimensioning of the IQAN-G12 module



Dimensioning of the IQAN-G12 module with connector cover



Unit = mm

For latest information visit our website www.iqan.com

Information in this instructionbook is subject to change without notice

Publ no MSG33-8418-IB/UK
Edition 2025-06-03

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