Technical Manual

Equipment: Industrial Processing Module

Model: XG1

Brand: Topcon

Manufacturer: iVolve Pty Ltd
Level 7, Greenhouse, West Village,
97 Boundary Street, West End,
Queensland 4101, Australia
https://www.ivolve.com/

We hereby confirm that this document is authentic and accurate and has been prepared in accordance with the requirements set forth by MTC. Should you have any questions, please do not hesitate to contact me using the details provided below.

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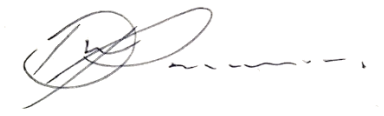
Signature: 

Table of Contents

1. Functionality

1.1 Product Description

The XG1 is designed for machine guidance and site-wide mesh networking. It is a ruggedized industrial processing module with multiple peripheral interfaces including Ethernet, RS-232, and CAN.

1.2 Product Operation

The XG1 operates as a wireless mesh router and Wi-Fi compliant access point, interfacing with onboard machine systems such as TPMS, VIMS, HMS, and tachometer/hour meters.

1.3 Product Functionality

The XG1 is used in the Guidance System to provide mining equipment such as Dozers and Excavators with high accuracy positioning. This positioning data is shared with mining trucks during the loading process for an effective and efficient operation.

1.4 Product Features

Features include integrated UHF radio receiver for RTK corrections, network RTK support, dual CAN buses, 10/100 Ethernet, RS-232 serial port, and a high precision GNSS receiver.

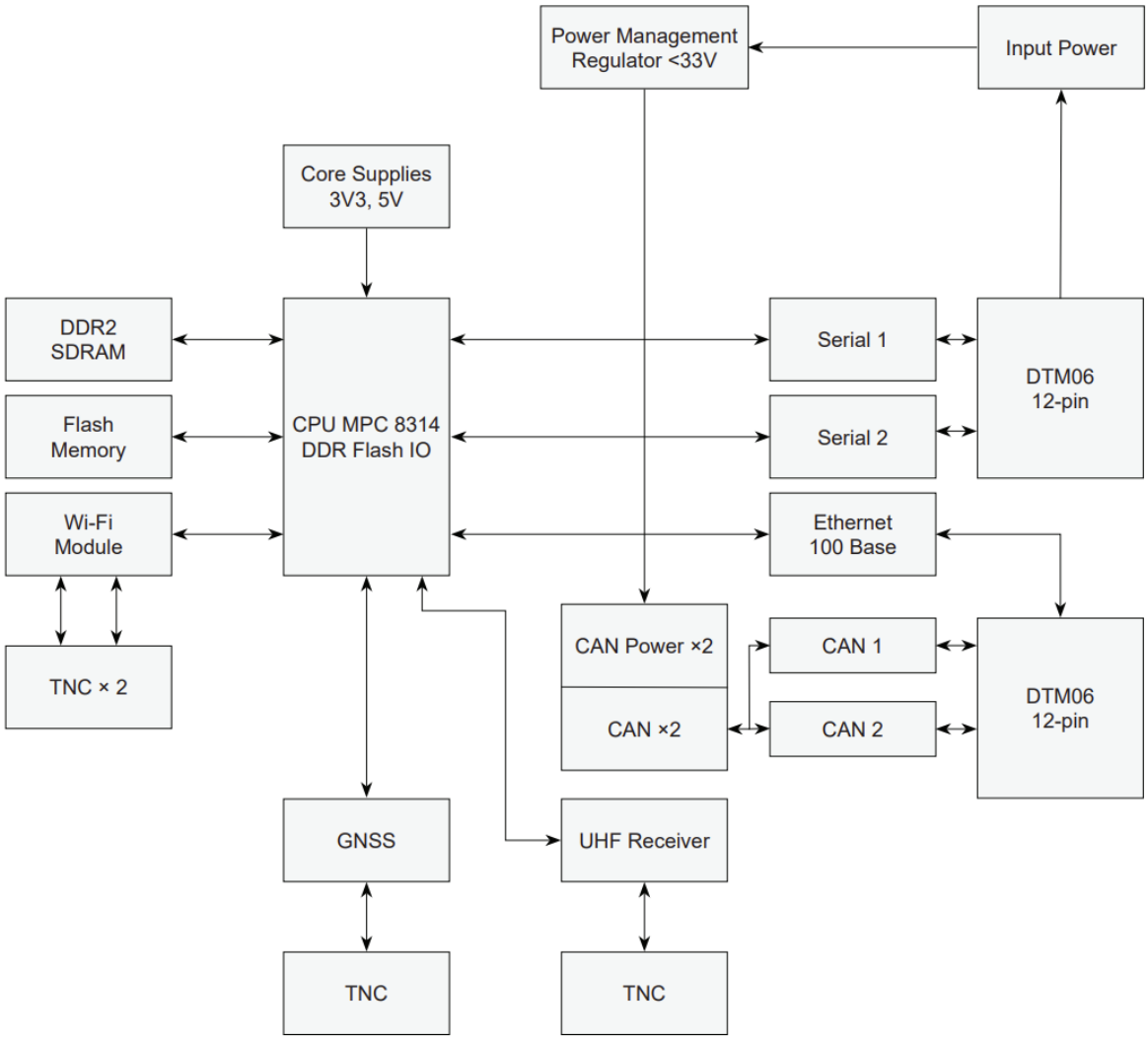
1.5 Intended Use

Intended for use in rugged environments to support machine guidance and connectivity across industrial sites.

1.6 Supported Technologies

Supports Wi-Fi (IEEE 802.11a/b/g/n), mesh networking, GNSS, UHF radio receiver, RS-232, CAN, and Ethernet.

1.7 Block Diagram



2. Interoperation

2.1 Network Interoperability

Supports mesh networking and Wi-Fi access point functionality for seamless device interconnection. The XG1 and other vehicles – mining trucks, mine site office - communicate over the iVolve Wi-Fi Mesh network to exchange and transfer data.

2.2 Network Architecture

The iVolve Guidance System, deployment of the XG1 and the Wi-Fi mesh and network architecture are described in Appendix 1.

2.3 Connectivity Technologies

The XG1 supports Wi-Fi (IEEE 802.11a/b/g/n) for connecting with other devices.

2.4 RF Specifications

Technology	2.4 GHz Wi-Fi (IEEE 802.11b/g/n)	5 GHz Wi-Fi (IEEE 802.11a/n)
Tx Frequency Bands	2412-2462 MHz	5180-5240, 5260-5320, 5500-5700, 5745-5825 MHz
Channel Bandwidth	20/40 MHz	20/40 MHz
Modulation	DSSS/OFDM	OFDM/256QAM, 64QAM, 16QAM, BPSK, QPSK
Max Output Power (EIRP)	25.90 dBm	5180-5240 MHz: 22.61 dBm 5260-5320 MHz: 20.33 dBm 5500-5700 MHz: 20.28 dBm 5745-5825 MHz: 24.22 dBm
Antenna Type	External	
Antenna Gain	3 dBi	

3. External Photographs


MC-i4
TOPCON


SINGLE
P/N 1006146-56
S/N 1486-12724
TOPCON
Made in USA

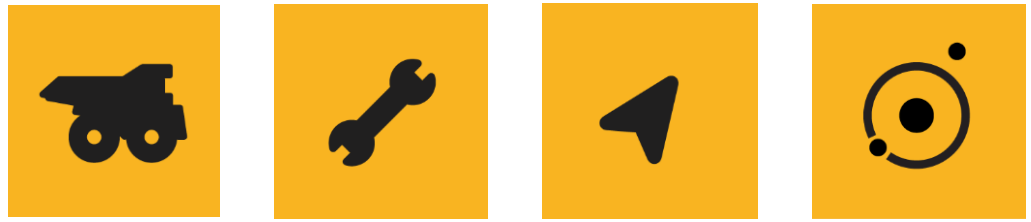

P/N: 1006146-56
S/N: 1486-12726
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Model XG1
CE
R 217-220627
D2260627217
UK CA
TOPCON
7400 National Drive • Livermore, CA • 94550 Made in USA

Appendix 1

XG1 Deployment - Network Architecture

IVOLVE MINE4D

mining made simple.



IVOLVE

PRODUCTION GUIDANCE

HEALTH SAFETY

GUIDANCE SYSTEM - OVERVIEW

- GUIDANCE – XG1 Hardware DOZER

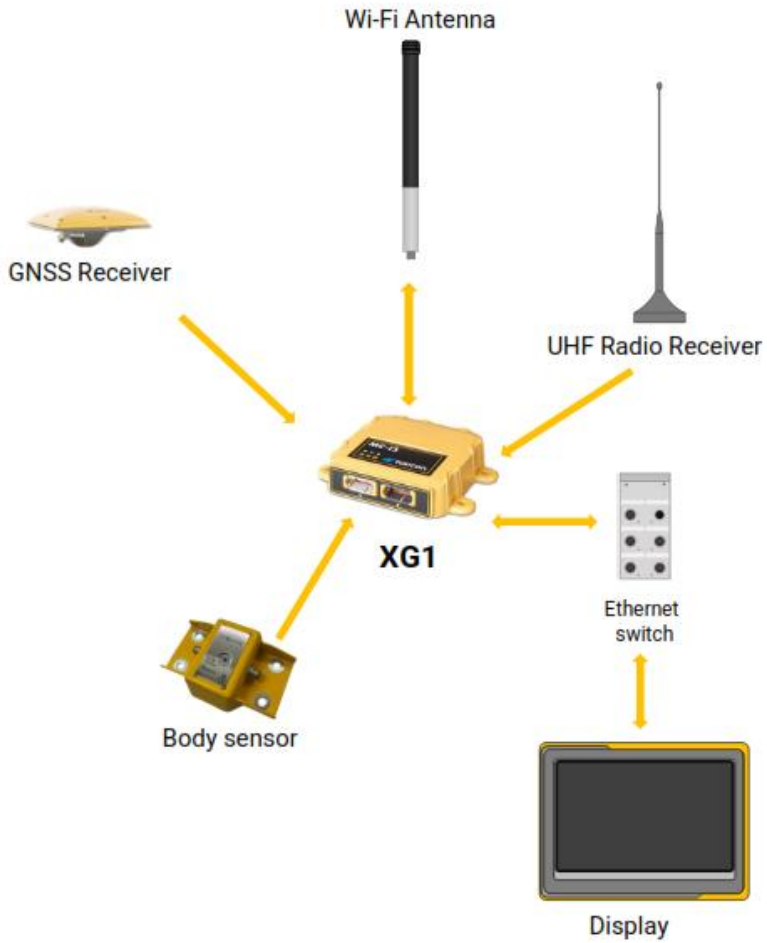
- COMMUNICATIONS

- Wi-Fi Mesh Network – Client Server

- Wi-Fi Mesh Network – Client Network Backbone

- Network Architecture Template – Customer Hosted Servers

GUIDANCE – XG1 Hardware DOZER



COMMUNICATIONS

Network

Each vehicle system is enabled with **Wi-Fi mesh networking** capability

Vehicle data exchange

Vehicles pair over **Wi-Fi mesh** during loading and exchange:

- Vehicle IDs
- Target & actual tonnage (& each pass)
- Material
- Destination
- Tray centre of gravity