



OUR GLOBAL  
COMPETENCE  
CENTRES

 APOLLO DISPLAY  
TECHNOLOGIES



FORTEC  
INTEGRATED



FORTEC  
UNITED KINGDOM



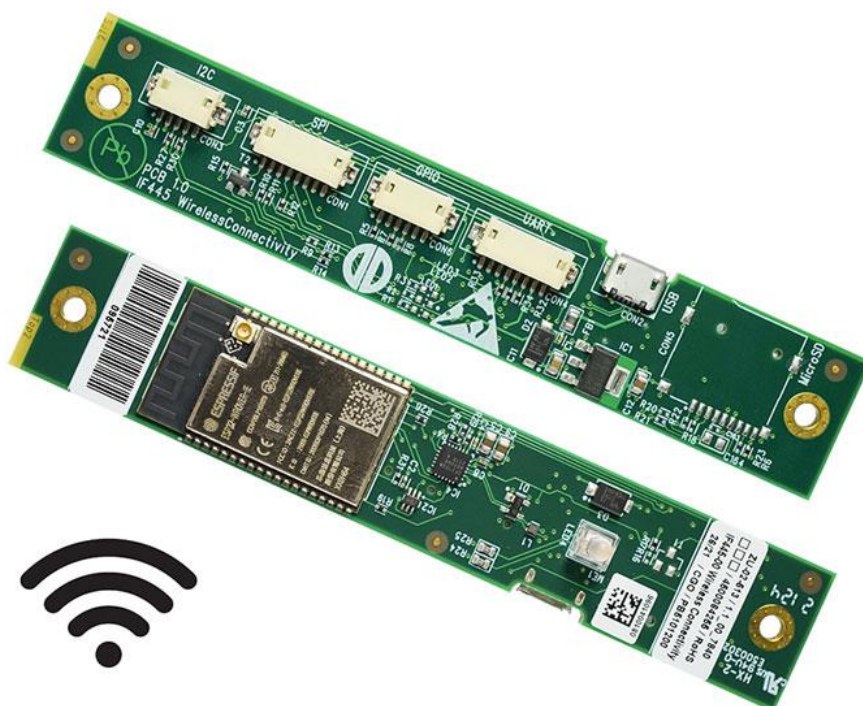
# Datasheet

## Distec

### IF445-01 Wireless Connectivity

Communication device

ZU-02-513R1.1



Version 1.2

15.02.2024

---

The information contained in this document has been carefully researched and is, to the best of our knowledge, accurate. However, we assume no liability for any product failures or damages, immediate or consequential, resulting from the use of the information provided herein. Our products are not intended for use in systems in which failures of product could result in personal injury. All trademarks mentioned herein are property of their respective owners. All specifications are subject to change without notice.

---

## Table of Contents

1	Revision History .....	4
2	Overview .....	5
3	IC Hardware Overview .....	5
4	Connector Overview .....	6
5	Absolute Maximum Ratings .....	9
6	Electrical Characteristics .....	9
7	Mechanical Dimension .....	10

## 1 Revision History

Date	Rev.No.	Description	Page
13.07.2021	1.0	Initial version	All
14.03.2022	1.1	Updated all Chapters	All
15.02.2023	1.2	Changed SAP # ZU-02-513>> ZU-02-513R1.1	2
		Changed productname IF445-00>>IF445-01	2
		New template	All

## 2 Overview

The Wireless Connectivity Board is a signal converter between the Wi-Fi and TTL-compatible UART interface. It is based on the ESP32-WROVER-IE SoC module with an external antenna. This device can be used to control e.g. the Mstar OSD adjustments or for I<sup>2</sup>C communication.

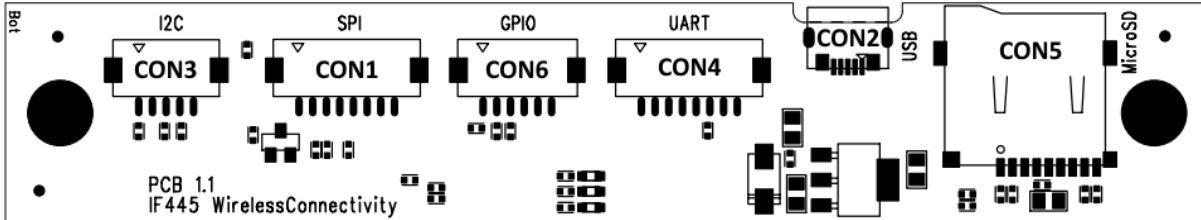
## 3 IC Hardware Overview

- SPI Interface
- UART Interface
- 4x GPIO's, 1x GPI
- I2C (Master and Slave mode possible)
- USB to TTL-compatible UART
- SD-Card interface (On request)
- Wi-Fi (2.4 GHz band)

The ESP32 SoC module have more functions, please see also:

[https://www.espressif.com/sites/default/files/documentation/esp32-wrover-e\\_esp32-wrover-ie\\_datasheet\\_en.pdf](https://www.espressif.com/sites/default/files/documentation/esp32-wrover-e_esp32-wrover-ie_datasheet_en.pdf)

## 4 Connector Overview



Connectors	Description	Type (Ref only)	Manufacturer (Ref only)
CON1	SPI Programming	DF13- 8P-1.25H	Hirose
CON2	USB-Micro	USB3075-30-A	GCT
CON3	I2C	DF13-5P-1.25H	Hirose
CON4	UART	DF13-8P-1.25H	Hirose
CON5	SD Card (On request)	0201D	Nexus Components
CON6	GPIO Connector	DF13-6P-1.25H	Hirose

CON1: SPI PROGRAMMING HEADER			
Pin	ESP32 Pin	Signal	Description
1		SPI_PROG_EN#	Enable Signal
2	IO18	SPI_CLK_FLASH	SPI Clock
3	IO19	SPI_SI_FLASH	SPI_SI
4	IO23	SPI_SO_FLASH	SPI_SO
5	IO5 (1)	SPI_CS (1)	SPI_CS
6	IO32 (1)	MSTAR_RESET_N (1)	MSTAR_RESET_N
7		GND	GND
8		+3.3V	+3.3V Power Input

### Notes:

- 1) Output Driver Strength max. 20mA.

CON2: USB MICRO CONNECTOR		
Pin	Signal	Description
1	VBUS	+5V USB Bus
2	D-	USB Data -
3	D+	USB Data +
4	NC	NC
5	GND	Ground

CON3: I2C CONNECTOR			
Pin	ESP32 Pin	Signal	Description
1		+3.3V_Output	+3.3V Power Output
2		GND	Ground
3	IO22 <sup>(1)</sup>	SCL	I2C Clock
4	IO21 <sup>(1)</sup>	SDA	I2C Data
5	SENSOR_VN <sup>(2)</sup>	INT	Interrupt, General Purpose Input

**Notes:**

- 1) Pullup with an 4.75kΩ resistor
- 2) Pin is floating

CON4: UART (TTL output)			
Pin	ESP32 Pin	Signal	Description
1		GND	Ground
2		-	Not connected
3	IO13	RX	Receive Data
4	IO15 <sup>(2)</sup>	TX <sup>(2)</sup>	Transmit Data
5	IO2 <sup>(1,3)</sup>	GPIO2 <sup>(1)</sup>	General Purpose IO
6	IO34 <sup>(2)</sup>	IO34 (GPI) <sup>(2)</sup>	General Purpose Input
7		+3.3V	+3.3V Power Input
8		GND	Ground

**Notes:**

- 1) IO2 must be 0V in programming Mode.
- 2) Pullup with an 10kΩ resistor
- 3) Output Driver Strength max. 20mA

CON5: SD CARD (1) (Not Assembled)		
Pin	Signal	Description
1	DAT2	Data Line 2
2	DAT3	Data Line 3
3	CMD	Command
4	+3.3V	Power
5	CLK <sup>(3)</sup>	Data Clock
6	GND	Ground
7	DAT0	Data Line 0
8	DAT1	Data Line 1
9	SW	Card detect switch
10	GND	Ground

**Notes:**

- 1) The SD-CARD interface is operated in SPI mode.

CON6: GPIO CONNECTOR			
Pin	ESP32 Pin	Signal	Description
1	GPI35 (2)	GPI35 (2)	General Purpose Input
2	GPIO25 (1)	GPIO25 (1)	General Purpose IO
3	GPIO26 (1)	GPIO26 (1)	General Purpose IO
4	GPIO12 (1)	GPIO12 (1)	General Purpose IO
5	GPIO14 (1)	GPIO14 (1)	General Purpose IO
6		GND	Ground

**Notes:**

- 1) Output Driver Strength max. 20mA
- 2) Pullup with an 10kΩ resistor



## 5 Absolute Maximum Ratings

Item	Symbol	Min.	Max.	Unit	Note
VBUS (CON2)	VBUS <sub>(5V)</sub>	0	5.5	VDC	
+3.3V Power Input	+3.3V	0	3.6	VDC	
Storage Temperature	T <sub>st</sub>	-20	+85	°C	
Operating Temperature	T <sub>op</sub>	-20	+80	°C	

**Note (1)** Within operating temperature range.

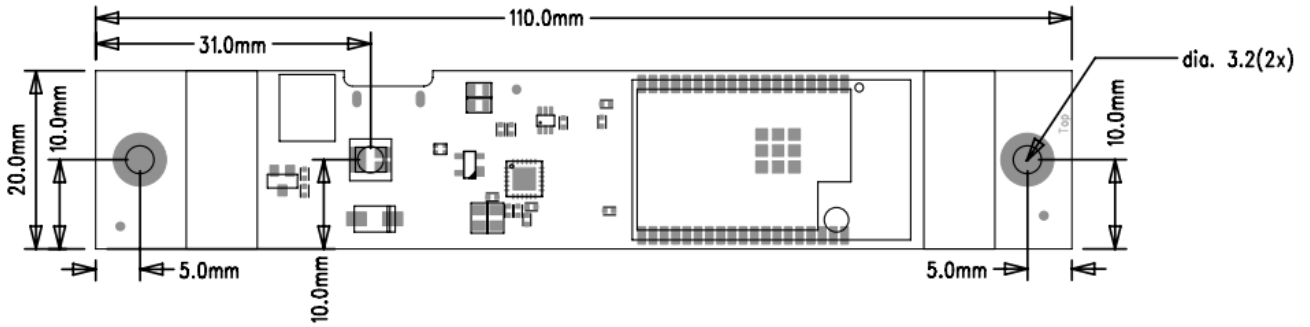
## 6 Electrical Characteristics

All measurements done at 25°C ambient temperature.

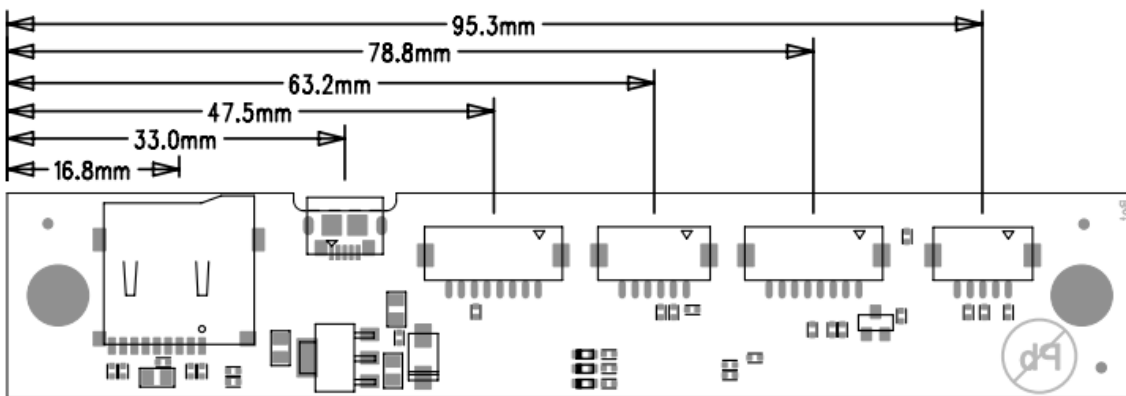
Item	Condition	MIN.	TYP.	MAX.	Unit	Note
VBUS (CON2)			5		VDC	
+3.3V Power Input		3.0V	+3.3V		VDC	
GPIO25, GPIO26, GPIO12, GPIO14, SPI_CS, MSTAR_RESET_N, GPIO2				20	mA	

7 Mechanical Dimension

Top-Side:



Bottom-Side:



Our company network supports you worldwide with offices in Germany, Austria, Switzerland, the UK and the USA. For more information please contact:

## Headquarters

Germany



**FORTEC**  
GROUP

**FORTEC Elektronik AG**

Augsburger Str. 2b  
82110 Germering

Phone: +49 89 894450-0

E-Mail: [info@fortecag.de](mailto:info@fortecag.de)

Internet: [www.fortecag.de](http://www.fortecag.de)

---

## Fortec Group Members

Austria



**FORTEC**  
INTEGRATED

**Distec GmbH Office Vienna**

Nuschinggasse 12  
1230 Wien

Phone: +43 1 8673492-0

E-Mail: [info@distec.de](mailto:info@distec.de)

Internet: [www.distec.de](http://www.distec.de)

Germany



**FORTEC**  
INTEGRATED

**Distec GmbH**

Augsburger Str. 2b  
82110 Germering

Phone: +49 89 894363-0

E-Mail: [info@distec.de](mailto:info@distec.de)

Internet: [www.distec.de](http://www.distec.de)

Switzerland



**ALTRAC**  
A FORTEC GROUP MEMBER

**ALTRAC AG**

Bahnhofstraße 3  
5436 Würenlos

Phone: +41 44 7446111

E-Mail: [info@altrac.ch](mailto:info@altrac.ch)

Internet: [www.altrac.ch](http://www.altrac.ch)

United Kingdom



**FORTEC**  
UNITED KINGDOM

**Display Technology Ltd.**

Osprey House, 1 Osprey Court  
Hinchingbrooke Business Park  
Huntingdon, Cambridgeshire, PE29 6FN

Phone: +44 1480 411600

E-Mail: [info@displaytechnology.co.uk](mailto:info@displaytechnology.co.uk)

Internet: [www.displaytechnology.co.uk](http://www.displaytechnology.co.uk)

USA



**APOLLO DISPLAY**  
**TECHNOLOGIES**  
A FORTEC GROUP MEMBER

**Apollo Display Technologies, Corp.**

87 Raynor Avenue, Unit 1  
Ronkonkoma, NY 11779

Phone: +1 631 5804360

E-Mail: [info@apolloDisplays.com](mailto:info@apolloDisplays.com)

Internet: [www.apolloDisplays.com](http://www.apolloDisplays.com)