Cavotec Micro-control AS

Module specification for MC-ITX2

Document number

SP-08-005

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Revision	1	2	3	4	5
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File name	G:\08\SP\SP-08-005 Module specification for MC-ITX2.pdf

Revision history

Rev.	Changes
1	First revision
2	Corrected descriptions in tables for connector J1 and J24.

Cavotec Micro-control AS

Module specification for MC-ITX2

1 General

MC-ITX2 exists in 1 variant:

MC order no.	Part name	Properties
M5-1031-3402	MC-ITX2	Terminal electronics for TRX radiomodules

Refer to Specifications for further description.

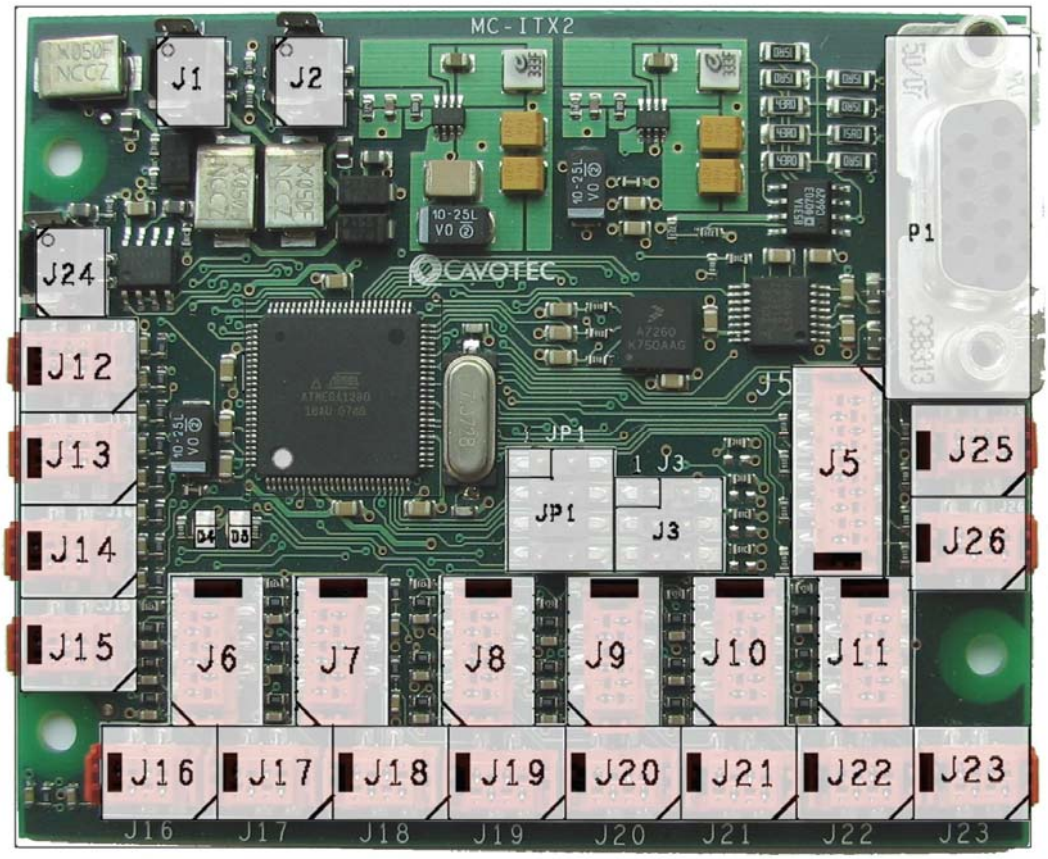
The circuit board is sensitive to electro static discharges. It is important to handle the circuit board in antistatic manners to prevent damage.

2 Definitions

MC-ITX2	Integrated processor module with I/O for terminal.
Base station	«Receiver»; the system part connected to the controlled object (the machine).
Terminal	«Transmitter» or «remote control»; the system part carried by the operator.
Jumper	A pair of pins that may be short-circuited using a separate short circuit hoop.
LED	Light emitting diode
MC	Micro-control
MIB-Bus	Micro-control Inter Board Bus

3 Module

This module specification refers to MC-ITX2. The module looks like this:



Component	Name	See chapter
J1	Battery input; 6-40 Volt supply voltage	Connections
J2	Battery output; power to MIB-modules	Connections
J3	In System programming port	Connections
J5	TRX-interface for connection radiomodule.	Connections
J6…J11	Analog I/O with digital supervision connectors.	Connections
J12	E-stop connector	Connections
J13	Startbutton connector	Connections
J14	On/Off switch connector	Connections
J15	Batterystatus/LED connector	Connections
J16…J23	Digital I/O connectors.	Connections
J24	Cable connection	Connections
J25 and J26	MIB-Bus-connectors	Connections
JP1	4 jumpers for configuration/programming/future use.	Configuration/programming
P1	RS-232 communication port (for programming)	Connections
D4	Green LED	Indicators
D5	Red LED	Indicators

4 Functionality

MC-ITX2 is only used in the terminal. It's the terminal's "heart and brain". MC-ITX2 has several connections to connect to switches, joysticks and LEDs.

The MC-ITX2 is fitted with a ATmega1280 processor.

Interfaces on the MC-ITX2:

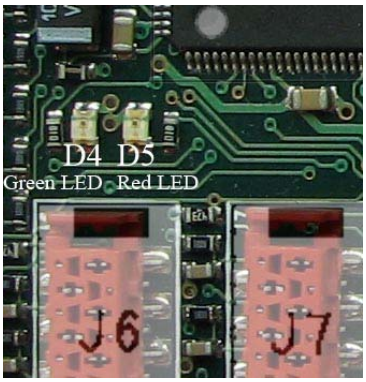
- 8 Digital I/O's (general I/O)
- 6 Analogue I/O's with digital supervision
- Battery power
- RS-485 and power via cable
- TRX-bus
- MIB-bus
- Dedicated I/O
    - Emergency stop
    - Start-button
    - Battery-status LED
    - On/Off switch (soft)

The MC-ITX2 has the capability of wide dc input supply in the range 6V-30V, controlled by a sepic converter. The internal voltage on the board is 3V3.

The MC-ITX2 has a built in tilt sensor that may be enabled to give roll-over and tilt protection.

5 Indicators

Name	Color	Explanation
D4	Green	On a terminal this one will light in the same way as the terminal battery lamp; Steady light when everything OK, and slow blink when low battery.
D5	Red	A terminal or a base station fault is indicated with various flashing patterns. Fatal failure is indicated by steady light. Off when normal operation. Blink pattern like status LED on earlier products.

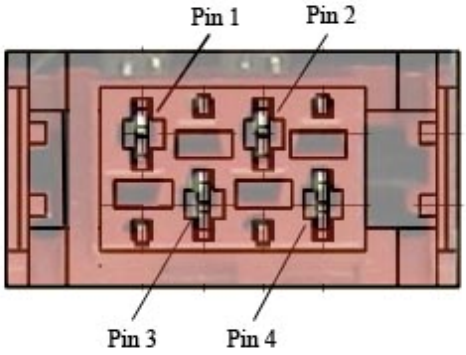


6 Connections

All input switches shall be related to GND.

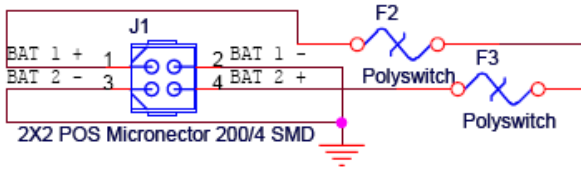
6.1 Micromatch pinout

Picture show pin-configuration for a 4-pin MicroMatch connector:



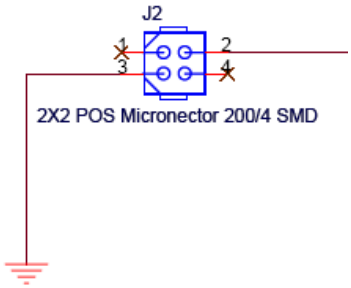
6.2 J1 Battery input

Name	Description
J1.1	Battery 1 positive terminal
J1.2	Battery 1 negative terminal
J1.3	Battery 2 negative terminal
J1.4	Battery 2 positive terminal



6.3 J2 Battery output

Name	Description
J2.1	NC
J2.2	Battery out positive terminal
J2.3	Battery out negative terminal
J2.4	NC



6.4 J3 In system programming port

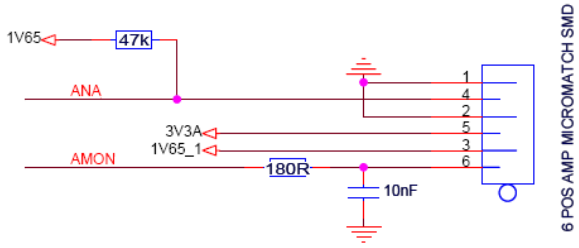
Use in production to load software into the module

6.5 J5 MC-TRX-BUS – interface to radio module

Connector for MC-TRX radiomodule. TRX-bus is interconnected pin to pin with flat ribbon cable.

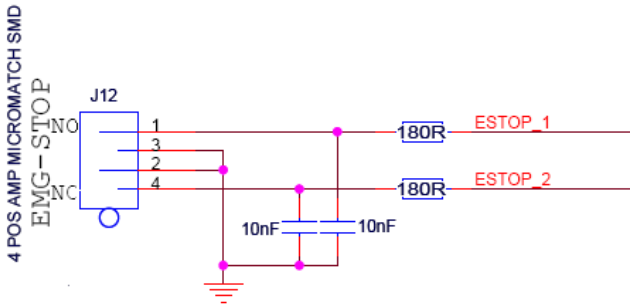
6.6 J6-J11 Analog I/O with digital supervision

Pin number	Description
1	GND
2	GND
3	1.65V signal
4	Analog input
5	3.3V signal
6	Digital supervision (Low for valid joystick function)



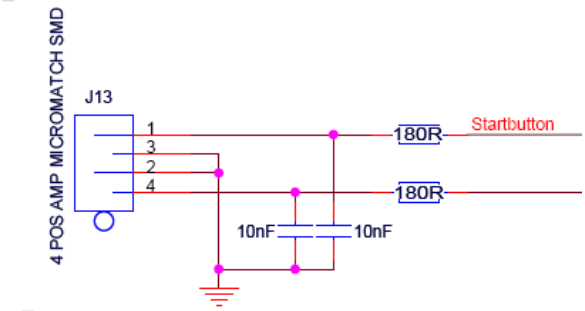
6.7 J12 E-stop connector (DIO 1)

Name	Description
J12.1	NO contact on ESTOP switch (DIO_1A)
J12.2	GND
J12.3	GND
J12.4	NC contact on ESTOP switch (DIO_1B)



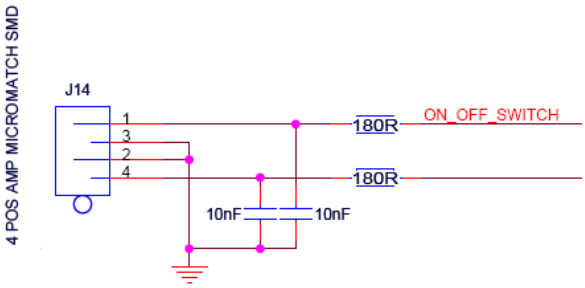
6.8 J13 Start-button connector (DIO2)

Name	Description
J13.1	Start button (DIO_2A)
J13.2	GND
J13.3	GND
J13.4	DIO2_B



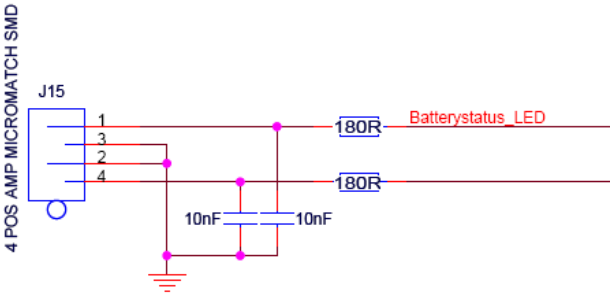
6.9 J14 On/Off switch connector (DIO3)

Name	Description
J14.1	ON/OFF-switch (DIO_3A)
J14.2	GND
J14.3	GND
J14.4	DIO_3B



6.10 J15 Battery status/LED connector (DIO4)

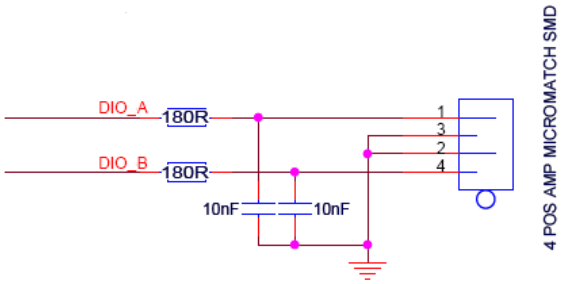
Name	Description
J15.1	Battery status LED (DIO_4A)
J15.2	GND
J15.3	GND
J15.4	DIO_4B



6.11 J16…J23 Digital I/O (DIO5…DIO12)

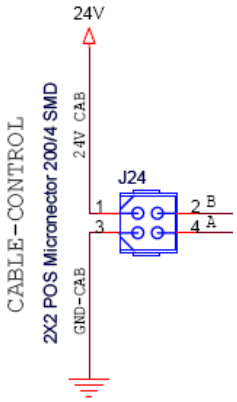
J16=DIO5…J23=DIO12

Pin number	Description
1	Digital I/O A
2	GND
3	GND
4	Digital I/O B



6.12 J24 cable connection

Name	Description
J24.1	+24V cable power
J24.2	Cable B-signal
J24.3	Cable GND
J24.4	Cable A-signal



6.13 J25 and J26 MIB-Bus connectors

The MIB-Bus is used for interconnecting MC-ITX2 with other MC modules with MIB-Bus. MIB-Bus is interconnected pin to pin with flat ribbon cable.

6.14 P1 RS232 communication port (for programming)

RS-232- connection. To be used for communication with other units that use RS-232 interface, for instance for loading of software from computer. The MC-ITX2 is configured as a DCE.

7 Configuration/programming

MC-IRX2 is configured by download the correct firmware and setup file.

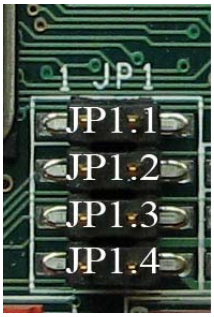
Firmware: Download from computer via RS-232 using MegaLoad program.

Setup file: Download from computer via RS-232 using terminal program (Xmodem protokoll). Setup file can also be done via cabelport with usind B-protocol test software.

Cavotec Micro-Control AS must supply the firmware and setup file.

7.1 Jumper settings

Name	Description
JP1.1	Enable bootloader download
JP1.2	Enable setup file download via RS232
JP1.3	Spare
JP1.4	Do not use!



8 Specification

8.1 Supply voltage

+6VDC - +40VDC

8.2 Current consumption

Operating mode, No LED's on, and no units connected to TRX- or MIB-bus:

8,8mA@6.0V / 7,8mA@8,4V / 5,1mA@30V

Operating mode, 18LED's connected and lit:

92mA@6,0V / 66mA@8,4V / 23mA@30V

Low-power-mode:

660uA@6,0V / 885uA@7,8V / 3mA@30V