

User's Guide

Manifold Receptacle (MR) Printed Circuit Board Assembly (PCBA)

Stryker PN: 0703-001-820

Document Rev: 1.1

REVISION HISTORY			
REVISION	COMMENTS	DATE	AUTHOR
0.1	INITIAL CREATION.	10/11/2015	G. ROCQUE
1.0	UPDATED FROM DESIGN REVIEW	10/14/2015	G. ROCQUE
1.1	UPDATED FROM NEMKO TCB COMMENTS	12/2/2015	G. ROCQUE

Description:

The Manifold Receptacle (MR) Printed Circuit Board Assembly (PCBA) is a custom designed circuit board intended to operate only within the Neptune 3 Rover and next generation of Neptune product line. The MR PCBA is made up of a custom mother board, Stryker PN 0590-085-340, an off the shelf RFID Reader daughter card, Stryker PN 0703-001-821, and an integrated antenna. Together, the mother board, the off the shelf RFID Reader daughter card, and integrated antenna constitute the Stryker MR PCBA, Stryker PN 0703-001-820. The mother board is manufactured by Stryker while the off the shelf RFID Reader daughter card is manufactured by Feig Electronics, PN 4320.000.00.

Features:

The MR PCBA is made up of an RFID interface circuit to communicate with the RFID Reader daughter card, an illumination circuit for the manifold receptacle, a manifold detection circuit, a DC to DC power supply, a sprinkler controller circuit, a canister illumination driver circuit, and a UART interface bus to communicate with the Rover Main Controller (RMC) PCBA. All of the MR PCBA features are custom to the Neptune 3 Rover system. The MR PCBA cannot operate on its own and is a slave sub-system within the Neptune 3 Rover system. A set of proprietary commands exist between the RMC PCBA and the MR PCBA to configure, perform execution of tasks, and transfer data upon command. The proprietary commands always originate from the master RMC PCBA and are responded to by the slave MR PCBA.

Finally, the MR PCBA contains an integrated RFID antenna designed to read passive HF RFID smart tags. The integrated RFID antenna is located on the mother board, Stryker PN 0590-085-340.

Technical Data:

Mechanical Data:

Housing: None provide, bare PCBAs only; installed within the Neptune 3 Rover

Dimensions: (W x H x D): 3.31inch x 0.62inch x 4.82inch (84.07mm x 15.75mm x 122.43mm)

Pwr/Comm Connector: 12 Pin-Connector, Samtec, IPL1-106-01-L-D-RA-K, custom wire configuration

Weight: 2.7 oz. (77g)

Electrical Data:

Supply Voltage: 17 V_{DC} to 41.2 V_{DC}

Current Draw: 1.0A Max at 36 V_{DC} Roving Mode or 0.5A Max at 18 V_{DC} Docking Mode

Power Consumption: 36W Roving Mode or 9W Docker Mode

Interfaces: RS485 – Level, 115.2 kbps, Proprietary Communication Protocol

Processor: Microchip dsPIC 33EP256MU810 and Fujitsu MB90F562B

Main RFID Functional Properties:

Reader: Ability to detect, read, and write to passive HF RFID smart tags

Operating Frequency: 13.56 MHz

Distance: Short communication range, 1.5" or less

Ambient Conditions:

Temperature Range: 0°C - 70°C

Humidity: 5 – 95% non-condensing

Federal Communications Commission (FCC) Statement Concerning Radio Frequency Interference:

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
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.