

Request for grant of Modular Approval (MA) for the Datamatic 100156-0001 (D4100 Main Board) as FCC ID:ODYD4100F

The Datamatic, Ltd manufactures a series of remote Residential Water Meter Reading Devices.

These are known as the D41xx series of MOSAIC Residential Water Meter readers. All of the end-product embodiments utilize the same internal electronics mounted in a plastic chassis with variations in the Cabling design to accommodate the different forms of Residential Water Meters. The current list of products is as follows: D4100, D4110, D4150, D4151, D4155. The Datamatic Part number for the finished radio module is 100156-0001, which is also known as the D4100 Main board. To prevent confusion in the naming, the FCC ID of ODYD4100F will be used when referring to the radio module and D41xx will be used when referring to the end-products.

ODYD4100F is an application specific, radio interface which is part of a Mosaic® wireless mesh networking system. Mosaic® is a proprietary frequency hopping spread spectrum (FHSS) network licensed from Axiometric, LLC and operates in the unlicensed 902 MHz to 928 MHz ISM band

Mosaic® wireless networks are used in utility applications for automatic utility meter reading. Mosaic® networks use proprietary communications protocols and only interoperate with other Mosaic® devices designed by Datamatic, Ltd. They are not marketed to the general public for consumer applications.

Datamatic, Ltd is requesting the grant of a Modular Approval for the ODYD4100F.

Datamatic, Ltd designed the ODYD4100F to meet the requirements for Modular Approval (MA). The ODYD4100F will be enclosed within and marketed to customers only as part of a D41xx assembly. The customer need only connect the D41XX end-product to the Water Meter. The radio equipment is sealed in the end-product by a urethane encapsulant and as such will be inaccessible to the customer without destroying the end-product and most probably the ODYD4100F.

Compliance of the ODYD4100F for Modular Approval:

1. The modular transmitter must have its own RF shielding. This is intended to ensure that the module does not have to rely upon the shielding provided by the device into which it is installed in order for all modular transmitter emissions to comply with Part 15 limits. It is also intended to prevent coupling between the RF circuitry of the module and any wires or circuits in the device into which the module is installed. Such coupling may result in non-compliant operation.

There is an RF shield covering the radio transmitter portion of the ODYD4100F.

2. The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with Part 15 requirements under conditions of excessive data rates or over-modulation.

No modulation / data inputs are provided. The ODYD4100F processor controls the data rate and FSK deviation frequency ensuring excessive data rates or over-modulation cannot occur.

3. The modular transmitter must have its own power supply regulation. This is intended to ensure that the module will comply with Part 15 requirements regardless of the design of the power supplying circuitry in the device into which the module is installed.

The ODYD4100F is powered by a Battery operating between 3.0 and 3.7 VDC. No other power sources are used.

4. The modular transmitter must comply with the antenna requirements of Section 15.203 and 15.204(c). The antenna must either be permanently attached or employ a "unique" antenna coupler (at all connections between the module and the antenna, including the cable). Any antenna used with the module must be approved with the module, either at the time of initial authorization or through a Class II permissive change. The "professional installation" provision of Section 15.203 may not be applied to modules.

The antenna is directly soldered to the ODYD4100F. In the finished application the ODYD4100F is embedded in a urethane potting material which prevents de-soldering of the antenna.

5. The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing. This is intended to demonstrate that the module is capable of complying with Part 15 emission limits regardless of the device into which it is eventually installed. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in Section 15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will be marketed with the module (see Section 15.27(a)). The length of these lines shall be length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified or commercially available (see Section 15.31(i)).

The ODYD4100F was tested in a stand-alone configuration. The ODYD4100F is battery powered.

6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: XYZMODEL1" or "Contains FCC ID: XYZMODEL1." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

The housings for the ODYD4100F have a label stating that the ODYD4100F is contained within the enclosure. The label has the identifying phrase "CONTAINS FCCID: ODYD4100F IC: 4421A-D4100F". Drawings specifying the label and placement are provided in the application for equipment authorization. These drawings are for use at the point of manufacture since there is no User access to the D41xx assembly once encapsulated.

7. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements. A copy of these instructions must be included in the application for equipment authorization. For example, there are very strict operational and timing requirements that must be met before a transmitter is authorized for operation under Section 15.231. For instance, data transmission is prohibited, except for operation under Section 15.231(e), in which case there are separate field strength level and timing requirements. Compliance with these requirements must be assured.

15.231 is not applicable to the D4100

8. The modular transmitter must comply with any applicable RF exposure requirements. For example, FCC Rules in Sections 2.1091, 2.1093 and specific Sections of Part 15, including 15.319(i), 15.407(f), 15.253(f) and 15.255(g), require that Unlicensed PCS, UNII and millimeter wave devices perform routine environmental evaluation for RF Exposure to demonstrate compliance. In addition, spread spectrum transmitters operating under Section 15.247 are required to address RF Exposure compliance in accordance with Section 15.247(b)(4). Modular transmitters approved under other Sections of Part 15, when necessary, may also need to address certain RF Exposure concerns, typically by providing specific installation and operating instructions for users, installers and other interested parties to ensure compliance.

Specific instructions for RF exposure are addressed in the user's guide.