

Exhibit O: Modular Approval Questionnaire
TEB-HUNTSU825

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.

The S4e Universal RF module contains its own RF shielding as shown in Exhibit B - Internal Photos. As depicted in Exhibit E - Test Setup Photos, the unit was tested in a stand-alone configuration. The unit was mounted in the top portion of the Landis+Gyr S4e meter housing. The use of the S4e meter housing did not provide any external shielding or filtering, so in effect it is a stand alone configuration. The housing used during testing is all plastic and glass (LCD display) and will be present in every configuration.

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.

The S4e Universal RF module's microprocessor communicates with the S4e meter to read the applicable data that it must transmit. It then provides modulation to the RF section. Therefore, the data rate of the communications between the S4e Universal RF module and the S4e meter has no bearing on the data rate of the transmitted signal. In other words, there is no way for the S4e meter to make the S4e Universal RF module transmit excessive data rates or over-modulate.

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 S4e Universal RF module requires a nominal 12VDC unregulated supply from the S4e meter and regulates it down to 3.6VDC and then through further regulation to 3.3VDC. The regulated supplies are used by the RF circuit. The S4e Universal RF module mounts inside of and connects to the S4e meter, which is connected to the AC mains. The testing proves the S4e Universal RF module, when connected to a representative compliant host connected to the AC mains, allows the host to remain compliant. The host used for testing was operated at 240 VAC, 60 Hz.

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 antennas are integral to the printed circuit board.

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 transmitter was tested in a stand-alone configuration per number 1 above.

6. The modular transmitter must be labeled with its own FCC ID number, and, if the FCC ID 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 FCC and IC IDs are contained on a label on the outside of the meter saying
"Contains FCC ID: TEB-HUNTSU825 Contains IC: 5931A-HUNTSU825"

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.

There is no special setup or operating condition the installer or end user need to be made aware of in order to make sure the transmitter operation complies with FCC Part 15 Subpart C Section 15.247.

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.

MPE Calculation

The Power Density (mW/cm²) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where: S = power density (in appropriate units, e.g. mW/cm²)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

MPE CALCULATIONS FOR MOBILE EQUIPMENT							
Transmit Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)	Antenna Gain (dBi)	Antenna Gain (Linear)	Distance (cm)	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)
2405	20.03	100.69	5.15	3.273	20	0.0656	1.00