

IDENT-M System V – Principle of operation

The control interface MVI-D2-2HRX is microprocessor controlled and interfaces between a serial master and the Antennas MVH2000-F15. The antennas are interfaces between the control interface MVI-D202HRX and the Data Carrier MVC-60-xxxK.

The microprocessor on the MVI-D2-2HRX interprets serial data received via its RS23 or RS422/485 port. This is shown on schematic 1/5. The components involved are the Line Driver, Control Logic and the PORTS block. Based on this data a control signal is generated and used to ASK modulate the HF field generated by the MVH2000-F15. The components involved are the microprocessor, the Serial-In-Out block (SIO) the line driver and components on schematic 2/5.

Oscillators on schematic 1/5 are used to generate a clock for the RTC (real time clock), SMPS (switching mode power supply) and SIO.

Once at ASK modulated control signals are received by the MVH2000-F15 a control logic module (CTL-Logic) decodes the serial string into the W, R, D and SIG lines. The HF signal generated in the MVH2999-F15 is stabilized by a PLL, amplified and band pass filtered to remove higher harmonics. Part of this signal is “retained” in the MVH2000-F15 for the purpose of mixing in the receiver.

The integrated antenna patch (right and left-handed circular antenna for Rx) is now used to emit the 2.45 GHz field. The R-Line is used to define the operation (Reading/writing), while the W and D lines are used to define the value to the data bit to be sent. Low bits are sent as a W=1 and D=0 signal, while high bits are the inverse.

The MVC-60-xxxK receives this field and preprocesses the signal pattern in the wakeup circuit and pattern detection. A valid pattern activates the onboard microprocessor. Once activated the microprocessor generates the appropriate “data answer”. At this point in time the MVH2000-F15 emits an unmodified HF. The MVC-60-xxxK “answers” back by modulating the “send” diode with that user data. This creates an impedance “mismatch” resulting in low power side bands to the un-modulated HF emitted by the MVH2000-F15. (See schematic 5/5)

These signals are received by the MVH2000-F15 receive patch (Circular Rx-antenna and schematic 3/5), amplified, filtered and demodulated. The principle of operation of the receiver is based on a Homodyne-Receiver. Here the received signal has the same frequency as the emitted frequency. The previously mentioned “retained” portion of the emitted field is now mixed with the received signal in the IQ-Demodulator. The resulting I- and Q-Signals combined are filtered and amplified before a binary signal is derived. This signal contains the data answer from the MVC-60-xxxK. This is shown on schematic 4/5.