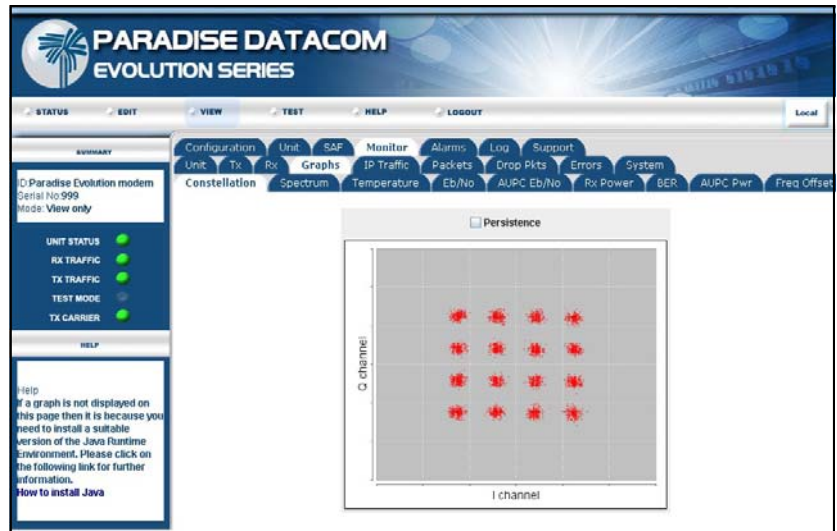


Can be used to detect and capture evidence of:

- ▶ System Phase Noise
- ▶ Signal Level Problems
- ▶ Distortion
- ▶ Carrier Cycle Skips
- ▶ Interference
- ▶ Carrier Stability Problems
- ▶ Intermittent Events

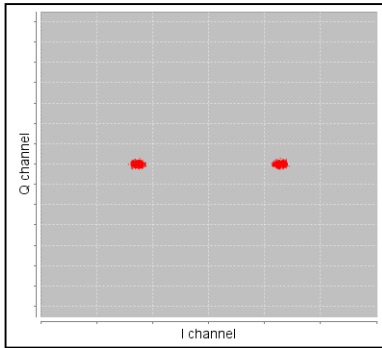


Receive Constellation Monitor display via Web Browser

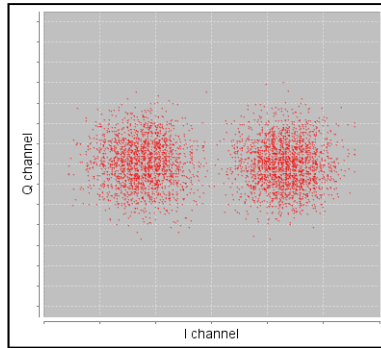
ALL EVOLUTION MODEMS INCLUDE A FREE CONSTELLATION MONITOR

- ▶ Constellation Monitor may be used whilst carrying and without affecting live traffic through the Modem
- ▶ Constellation Monitor indicates carrier phase integrity
- ▶ The number of constellation points indicates modulation scheme:
 - 2 points = BPSK
 - 4 points = QPSK/OQPSK
 - 8 points (circular pattern) = 8PSK
 - 16 points (4 x 4 pattern) = 16QAM
- ▶ The spread of the constellation points (clusters) indicates link quality
- ▶ Even spread of clusters indicates added thermal noise
- ▶ Elongated clusters indicates system phase noise
- ▶ User-selectable persistence can be used to capture long term and intermittent events
- ▶ Invaluable for capturing interference and intermittent effects on satellite
- ▶ Field proven capabilities - offers satellite system debug capabilities
- ▶ Can print or save Constellation Pattern with just a mouse click
- ▶ Constellation Monitor content (CSV format) can be emailed **by the Modem** to chosen recipients, either on alarm detection, or on a regular schedule - this is easily converted to an Excel graph with just 4 mouse clicks
- ▶ All Evolution Series Modems include the Receive Constellation Monitor for free, accessed via web-browser
- ▶ Constellation Monitor available in all Modems at all locations - can debug remote sites from another location **without sending an Engineer to site and with no additional test equipment**

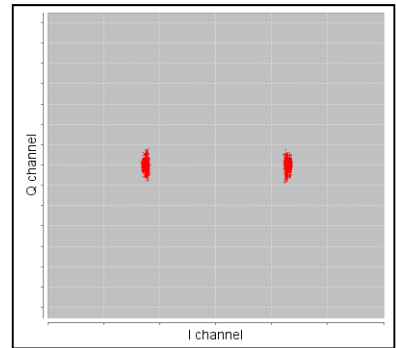
EXAMPLES OF CONSTELLATION PATTERNS FOR DIFFERENT CONDITIONS



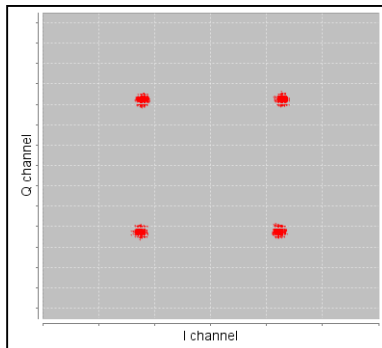
BPSK No Thermal Noise



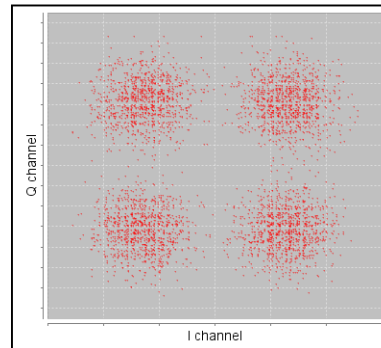
BPSK plus Thermal Noise



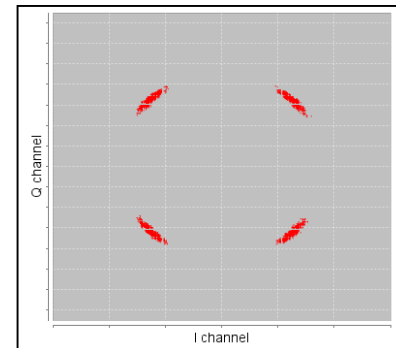
BPSK plus Phase Noise



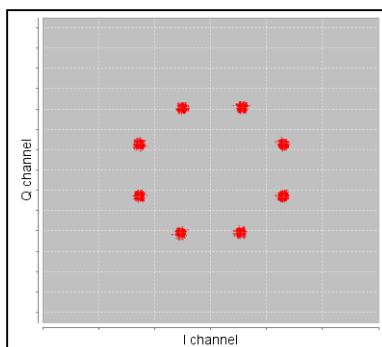
QPSK No Thermal Noise



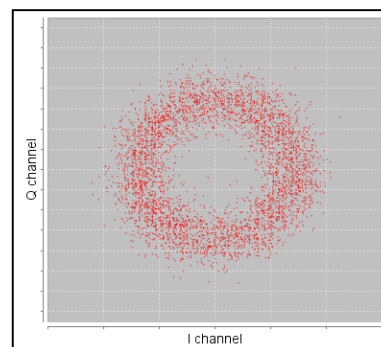
QPSK plus Thermal Noise



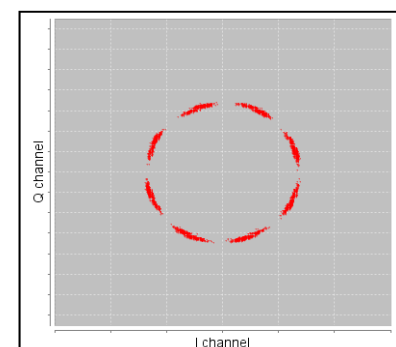
QPSK plus Phase Noise



8PSK No Thermal Noise

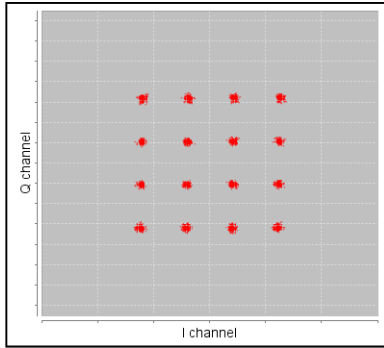


8PSK plus Thermal Noise

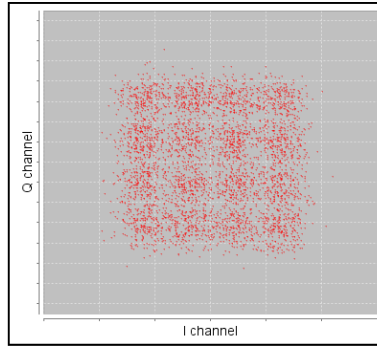


8PSK plus Phase Noise

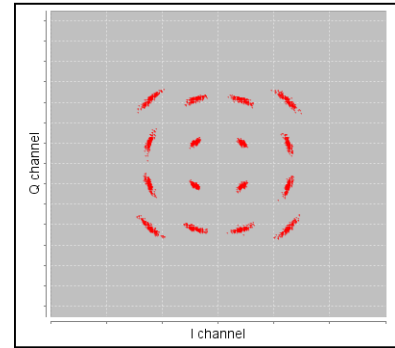
EXAMPLES OF CONSTELLATION PATTERNS FOR DIFFERENT CONDITIONS



16QAM No Thermal Noise



16QAM plus Thermal Noise



16QAM plus Phase Noise

PERSISTENCE CONTROL - FOR CAPTURING INTERMITTENT / INFREQUENT EVENTS

Constellation Monitor via Web Browser

Default operation continually refreshes the constellation display

User selectable persistence control - continually writes more samples on top of existing samples

The persistence control allows the user to capture brief or long term variations in the constellation display. Right-clicking on the graph allows the user to save or print the display.