

- (57) Abstract:** A downhole network-interface unit provides remote diagnostics and control for a downhole communications network. A network-interface unit may convert native format signals from downhole devices to a signal to be sent to a surface controller. Remote diagnostics of signal anomalies in the downhole network can be provided by the network-interface unit to provide diagnostics information, such as measurements or signal waveforms, to the surface. In some examples, the network-interface unit can also segment the downhole network as needed to maintain network health and integrity. Network segmentation can take place automatically in response to determining an anomalous condition or can be directed from a surface controller.

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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- *with international search report (Art. 21(3))*