CLAIMS

1. A communication connection in a subsea well for converting an optical signal from an optical fibre to an electrical signal, comprising a small form factor pluggable device.

2. A connection according to claim 1, wherein the connection is between said optical fibre and a subsea electronics module at a well tree or is at an underwater termination assembly or is at a subsea distribution unit.

3. A connection according to claim 1 or 2, wherein said fibre is in an umbilical.

4. A connection according to any preceding claim, including a further small form factor pluggable device coupled with the first small form factor pluggable device for converting said electrical signal to an optical signal.

5. A connection according to any preceding claim, wherein the or each small form factor pluggable device is received in an electrical connector.

6. A connection according to claim 5, wherein the connector comprises first and second mated parts, each having a respective shell portion, the or each small form factor pluggable device being received in a respective one of the shells.

7. A connection according to claim 2 or any of claims 3 to 6 as dependent on claim 2, wherein said connection is between said fibre and a subsea electronics module and power for the or each small form factor pluggable device is provided from the subsea electronics module.

8. A communication connection according to any of claims 1 to 6, wherein power for the or each small form factor pluggable device is provided

by electrical power supplied from a surface facility or is provided by optical energy from a further optical fibre or is provided by a rechargeable battery.

9. A method of providing a communication connection in a subsea well for converting an optical signal from an optical fibre to an electrical signal, comprising using a small form factor pluggable device to convert the optical signal to an electrical signal.

10. A method according to claim 9, wherein the connection is between said optical fibre and a subsea electronics module at a well tree or is at an underwater termination assembly or is at a subsea distribution unit.

11. A method according to claim 9 or 10, wherein said fibre is in an umbilical.

12. A method according to any of claims 9 to 11, comprising providing a further small form factor pluggable device coupled with the first small form factor pluggable device to convert said electrical signal to an optical signal.

13. A method according to any of claims 9 to 12, wherein the or each small form factor pluggable device is received in an electrical connector.

14. A method according to claim 13, wherein the connector comprises first and second mated parts, each having a respective shell portion, the or each small form factor pluggable device being received in a respective one of the shells.

15. A method according to claim 10 or any of claims 11 to 13 as dependent on claim 10, wherein said connection is between said fibre and a subsea electronics module and power for the or each small form factor pluggable device is provided from the subsea electronics module.

16. A method according to any of claims 9 to 14, wherein power for the or each small form factor pluggable device is provided by electrical power supplied from a surface facility or is provided by optical energy from a further optical fibre or is provided by a rechargeable battery.

CLAIMS

What is claimed is:

1. A communication connection in a subsea well for an optical fiber, the communication connection comprising:

an electrical connector comprising first and second mating parts, each of the first and the second mating parts is having a respective shell portion;

a first small form factor pluggable device received in the shell portion of the first mating part for converting an optical signal of the optical fiber into an electrical signal; and

a second small form factor pluggable device received in the shell portion of the second mating part for converting the electrical signal back to an optical signal;

wherein a power for both the first and the second small form factor pluggable devices is provided by an optical energy from a further optical fiber in a communication with a photovoltaic cell, wherein the photovoltaic cell is to convert the optical energy into the power for both the first and the second small form factor pluggable devices, and wherein the photovoltaic cell is molded in an end portion of the electrical connector.

2. The communication connection of claim 1, wherein the communication connection is between the optical fiber and a subsea electronics module at a well tree.

3. The communication connection of claim 2, wherein:

the power for both the first and the second small form factor pluggable devices is provided from the subsea electronics module.

4. The communication connection of claim 1, wherein the optical fiber is in an umbilical.

5. The communication connection of claim 1, wherein the first and the second small form factor pluggable devices are received in the electrical connector.

6. The communication connection of claim 1, wherein the power for both the first and the second small form factor pluggable devices is provided by a rechargeable battery.

7. The communication connection of claim 1, wherein the communication connection is between the optical fiber and a subsea electronics module is at an underwater termination assembly.

8. The communication connection of claim 1, wherein the communication connection is between the optical fiber and a subsea electronics module is at a subsea distribution unit.

9. A method of providing a communication connection in a subsea well, the method comprising:

providing first and second mated parts which are coupled to each other, each of the first and second mated parts is having a respective shell portion;

using a first small form factor pluggable device to convert an optical signal to an electrical signal;

disposing the first small form factor pluggable device to be received in the shell portion of the first mated part for converting the optical signal of an optical fiber into the electrical signal; and

disposing a second small form factor pluggable device to be received in the shell portion of the second mated part for converting the electrical signal back to an optical signal, wherein the first and the second small form factor pluggable devices are received in an electrical connector;

powering both the first and the second small form factor pluggable devices by an optical energy from a further optical fiber in a communication with a photovoltaic cell, wherein the photovoltaic cell is to convert the optical energy into a power for the first and the second small form factor pluggable devices, and wherein the photovoltaic cell is molded in an end portion of the electrical connector.

10. The method of claim 9, wherein the communication connection is between the optical fiber and a subsea electronics module is at a well tree.

11. The method of claim 10, wherein said powering both the first and second small form factor pluggable devices are provided from the subsea electronics module.

12. The method of claim 9, wherein the optical fiber is in an umbilical.

13. The method of claim 9, wherein said powering both the first and second small form factor pluggable devices are provided by a rechargeable battery.

14. The method of claim 9, wherein the communication connection is between the optical fiber and a subsea electronics module is at an underwater termination assembly.

15. The method of claim 9, wherein the communication connection is between the optical fiber and a subsea electronics module is at a subsea distribution unit.