Quantum automation platform
Transparent Factory
Overview

Overview
TF Service selection guide

Transparent Factory services enable:

Communication between PLC stations, computers and other devices	■ Modbus TCP/IP
Configuration, diagnostics and HMI pages for Transparent Factory devices	■ HTTP web pages
Transfer of custom user web pages to a Transparent Factory device	■ FTP (file transfer protocol)
Management of the networking features of a Transparent Factory device using industry standard network management software	■ SNMP (simple network management)
Automatic network address allocation for devices on the network	■ BOOTP/DHCP
Automatic transfer of information between a PLC and other field devices such as Momentum input/output blocks, variable speed drives and any other Modbus compliant devices.	■ Input/output scanning
Real time data transfer between devices for data transfer and plant synchronization.	■ Global data
User customizable web pages to show live data from a Transparent Factory device.	■ FactoryCast
Automatic configuration and addressing of a replacement device to allow direct replacement of a failed device without user configuration.	■ Faulty device replacement (FDR)

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Architecture (continued)
Presentation

Introduced by Schneider Electric, Transparent Factory provides seamless communication among automation, manufacturing and business systems. Networking technologies and new services make the sharing of information among sensors, controllers, workstations, third party and business systems more efficient than ever. Integrated web servers in automation controllers, networking components, and field devices provide transparent access to configuration information, remote diagnostic data, and integrated HMI features. The Transparent Factory cornerstone is industry standards and the heart of this foundation is the network Ethernet TCP/IP. Ethernet TCP/IP provides a single, uniform network capable of satisfying all the communication needs from automation sensors to factory management systems.

When many diverse systems are involved, Transparent Factory's use of standard technologies provides for important cost reductions in design, installation, maintenance and training.

Just as Ethernet TCP/IP has been built to fulfill all the needs of industrial systems, the physical Ethernet network has also been expanded to include products suited for harsh industrial environments.

The Transparent Factory offer consists of the following:

■ **TF Ethernet services -** These services are built on Ethernet TCP/IP to meet the demands of the automation user in terms of functionality, performance and quality of service.

■ **TF products for automation -** Schneider offers a full range of PLCs, distributed input/output, motor speed controllers, IPCs, gateways, and other devices that implement Transparent Factory services.

■ **ConneXium, a complete Ethernet networking system -** ConneXium offers a robust range of hubs, switches, transceivers, and Ethernet cables well adapted to harsh factory environments.

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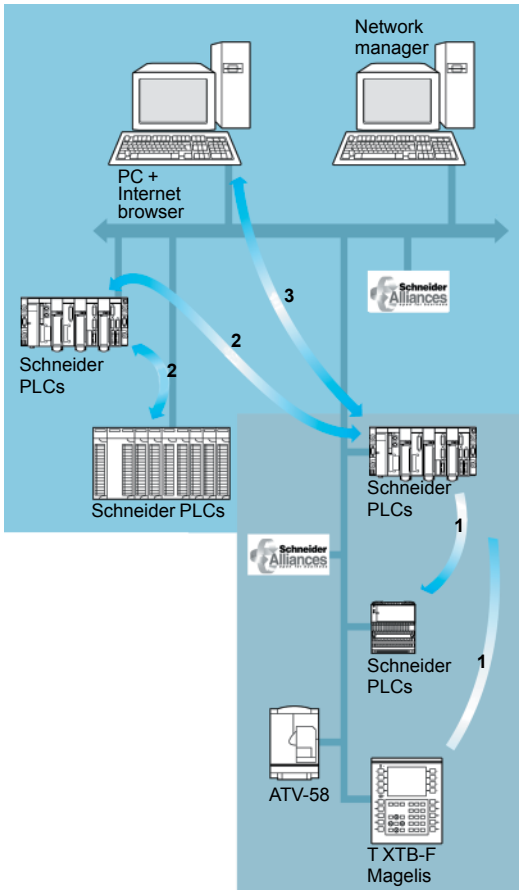

Architecture (continued)

Nota: *the numbers at the beginning of the following paragraphs refer to the corresponding numbers in the diagram at left.*

1. Field level

■ **Vertical communication to the devices: PLC, PC ⇨ peripheral devices**

Application program is concerned with the control of input/output devices. Data must be transferred to and from a large number of different input/output devices in a fast, deterministic, repeatable manner.
Response times are required to be in the range of 0.01 – 0.1 seconds.

Services available:
□ Input/output scanner,
□ Open Modbus TCP/IP messaging.

■ **Simple SCADA services: PC ⇨ PLC, peripheral devices**

A simple SCADA package is required to monitor or control a device or field equipment.

Service available:
□ HTTP server – Custom web pages.

■ **Automatic replacement of faulty devices: PLC ⇨ peripheral devices**

Assigning of Ethernet address and configuration parameters to a replacement device.

The system is required to automatically recognize and configure a replacement device that is installed without the need for user intervention or configuration.

Service available:
□ FDR – Faulty device replacement.

2. Inter-PLCs level

■ **Horizontal communication: PLC ⇨ PLC application sychronization, data transfer**

Communication is required to transfer data between PLC applications and to sychronise several PLC applications. Data must be exchanged between several PLC stations in a time critical manner.
Response times are required to be in the range of 0.01 – 0.5 seconds.

Service available:
□ Global data.

■ **Horizontal communication: PLC ⇨ PLC programming, diagnostic, data transfer**

Simple communication interfaces are required to allow for the transfer of data between PLC applications. Data must be sent from one PLC station to another when required, but the frequency of the data transfer may vary.
Response times are required to be in the range of 0.2 – 1 second.

Service available:
□ Modbus TCP/IP messaging.

Architecture (continued)

3. Control level

■ **Vertical configuration of devices: PLC, PC ⇨ peripheral devices**

A device needs to have an IP address and associated parameters assigned automatically.

Services available:
□ BOOTP,
□ DHCP.

■ **PC to PLC communication: PLC ⇨ computers MES, ERP**

Communications of this type utilize standard networking infrastructure and protocols to exchange large data amounts with supervision or management systems. The PLC system may be required to implement a protocol that is custom to the connected system.
Response time is not critical.

Services available:
□ HTTP – Web pages and Java Applets,
□ OPC,
□ Open Modbus TCP/IP messaging,
□ TCP Open.

■ **PC to PLC communication: PLC ⇨ computers SCADA**

Communications of this type utilize standard networking infrastructure and protocols to exchange large data amounts with multiple PLC systems.
Response times are required to be in the range of 0.5 – 2 seconds.

■ **Configuration, monitoring and troubleshooting of devices: PC ⇨ PLC, peripheral devices**

A simple method is needed to configure, monitor or diagnose a device or PLC via a standard PC.