

2. Introduction

The system interface MNS Digital Gateway is an industrial PC equipped with interface cards and ports required for communication internally to M10x and externally to process control systems as well as to the MNS Digital Edge Gateway which provides condition monitoring features and functions as well as edge connectivity to ABB Ability™ cloud based solutions.



Figure 1: MNS Digital Gateway

One MNS Digital Gateway can communicate internally to up to 128 M10x / field devices by Modbus RTU. If more than 128 M10x / field devices are installed, then additional MNS Digital Gateway have to be configured.

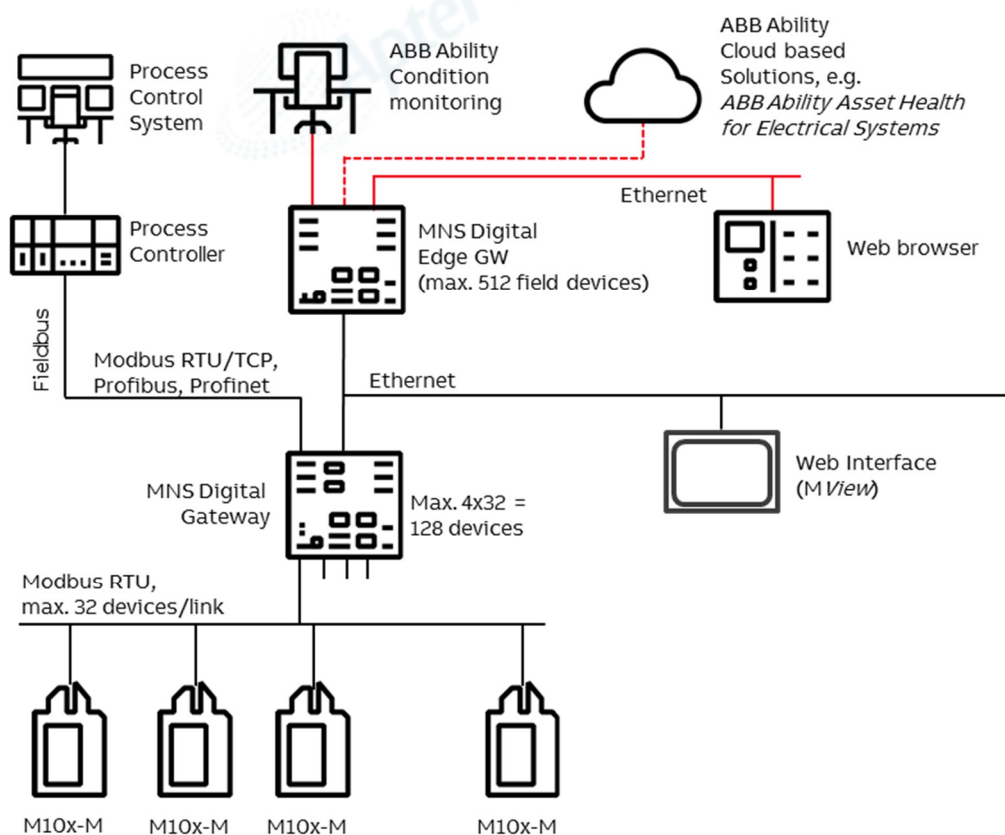


Figure 2: MNS Digital System Configuration with M10x

2.1. Hardware Types and Technical Data

The configuration of MNS Digital Gateway depends on the selected communication protocol to the DCS. For the Modbus communication to DCS the hardware shown in the table below is applicable

Fieldbus Protocol		Modbus	
Fieldbus Hardware Interface	RS 485 & Ethernet	RS 422 & Ethernet TCP/IP	RS 232 & Ethernet
	TCP/IP IEEE 802.3	IEEE 802.3	TCP/IP IEEE 802.3
MNS Digital Gate-way ID		1TGE120021R0810	

Picture

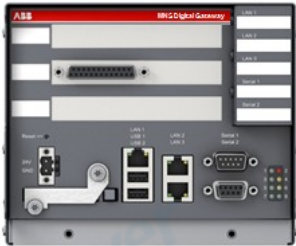


Table 1 MNS Digital Gateway Modbus Hardware

For communication to M10X, MNS Digital Gateway is connected via RS485 with Modbus RTU protocol. As one segment of Modbus RTU is only able to support 32 devices, MNS Digital Gateway for M10x is supplied with four Modbus RTU port to support a maximum of 128 number of devices.

ELECTRICAL DATA	
Power Supply	24V DC (19 – 31V DC)
Power Consumption	Typical 800mA, maximum 1000mA
MECHANICAL DATA	
Weight	2.5 kg
Dimensions H x W x D	140 x 160 x 165 mm
ENVIRONMENTAL DATA	
Storage Temperature	-20°C to + 70°C
Operating Temperature	0°C to 55°C
Degree of Protection	IP51
MTBF (Mean Time Between Failures)	46 years @ 40°C

Table 2 MNS Digital Gateway Technical Data

2.2. Modbus Standard

MODBUS is a serial data communication protocol and was originally developed as a communication language for MODICON programmable controllers, its rights now reside with the Modbus-IDA organization.

The software on the MNS Digital Gateway supports the pure Master-Slave operation as defined in the MODBUS RTU specification. This manual describes the MNS Digital Gateway communication with MODBUS protocol in RTU and TCP modes.

The MODBUS communication protocol is implemented within the MNS Digital Gateway to enable MNS Digital to provide interface possibilities to process control systems or any other external systems that supports MODBUS RTU / TCP protocol handling.

The MODBUS configuration can be used in point to point configuration or in multi-drop mode. In Master-Slave MODBUS architecture, the MNS Digital Gateway is always used in a slave (TCP Server) mode. The master station controls the traffic on the bus, in this case, by PCS/DCS or PLC system. The MNS Digital Gateway responds to the queries received from master station as per the MODBUS specification.

2.2.1. Basics

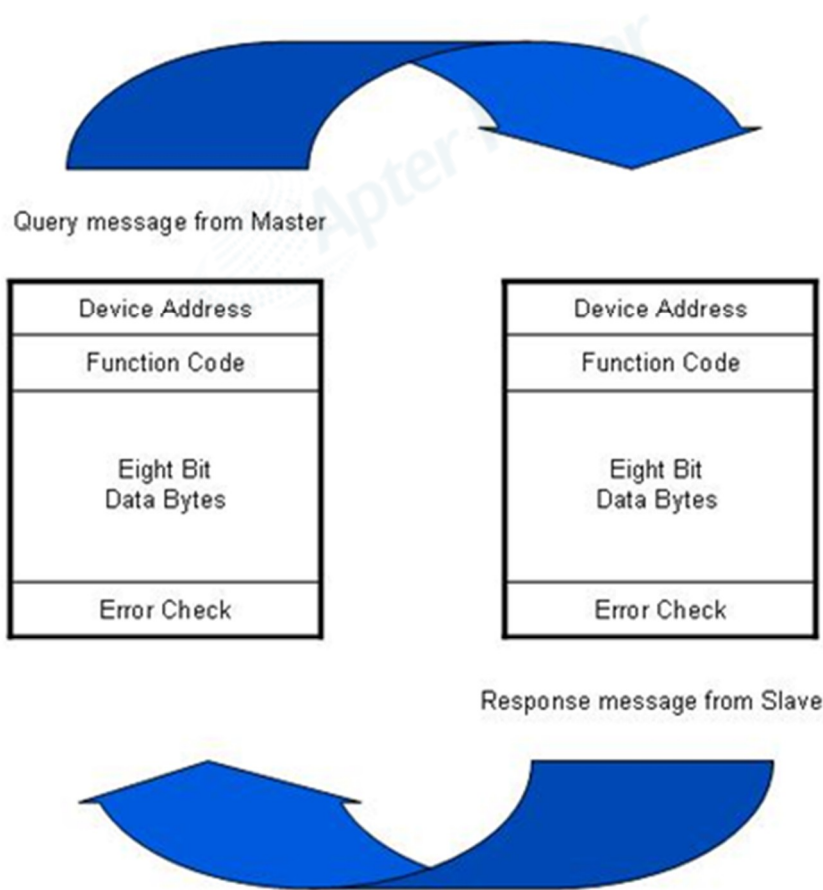


Figure 3 Master Slave Query Response Cycle