



IEC 60870-5-104 Controlled Station to Modbus TCP/IP Master Gateway MBM-CGD-104CE

The MBM-CGD-104CE device is a multipurpose solution for the many applications where Modbus TCP/IP connectivity can be used to publish information through an IEC 60870-5-104 Controlled Station into an external control system. This protocol converter is an industrial grade module designed with a Modbus TCP/IP Master support, enabling easy connection to other Modbus devices. In combination with the IEC60870-5-104 Controlled Station support, the module provides a very powerful interface to the many IEC 104 master devices which are in use in the industrial systems today. Applications for the module are found in most industries, especially Electrical Power and Green Energy Systems.

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IEC 60870-5-104 Controlled Station to Modbus TCP/IP Master Gateway

MBM-CGD-104CE

The i-less Modbus TCP/IP to IEC60870-5-104 Controlled Station Gateway creates a powerful connection between devices on a Modbus TCP/IP network and IEC 104 Controlling Station. This device is based on a National Instruments cRIO-9064 DIN-rail mounted device gateway and it provides two Ethernet ports. These two Ethernet ports allow to isolate the field network from the control network. The Modbus TCP/IP protocol driver can interface many different field devices that supports the protocol. The MBM-CGD driver supports Master connections. The monitoring and configuration is done through a Windows desktop application. The 104CE module accepts commands from an attached controlling station on the network and generates unsolicited messages.

Modbus TCP/IP

The Modbus TCP/IP driver interfaces with the internal controlled station database in the module. This permits the sharing of data between the Modbus TCP/IP and other networks and devices.

Modbus TCP/IP Master (Client)

General	Actively reads and writes data with Modbus TCP/IP compatible devices. One master connection to one slave device. The addresses and commands are configurable.
Configurable Parameters	IP, Port, PollRate, Modbus Addresses
Command List	Unlimited configurable points. The performance depends on the number of configured commands and the established PollRate



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IEC 60870-5-104 Controlled Station

Acting as a Controlled Station, the protocol driver accepts commands from an IEC-60870-5-104 Controlling Station to read/write data stored in its own internal database.

The 104CE module can act as an input/output module between the IEC 60870-5-104 Ethernet network and many of the other serial and network protocols, as well as on request proprietary protocols.

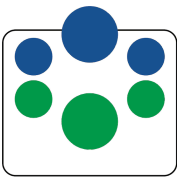
General specifications include:

- User-definable Point/ASDU addresses map
- Protocol implementation conforms to the IEC 60870-5-104 specification with fully configurable parameters (see supported ASDU types)
- SNTP (Simple Network Time Protocol) synchronization with an external source (on request).

The 104CE module accepts commands from an attached controlling station on the network and generates unsolicited messages. These last sets of messages are either spontaneous or cyclic. Data transferred to the host is derived from the module's internal database. The remote master device can control data in the database and hence the devices connected using the other protocol in the module using standard control messages supported in the protocol. The remote slave device receives the requests according to the previously configured internal database in the module, to control outputs and monitor inputs.

IEC 60870-5-104 Controlled Station

General	One Controlling Station supported. Solicited and unsolicited messages are supported. Multiple configurable Sectors/Channels, one active Sector/Channel at a time.
Configurable Parameters	By Channel 104 Link Parameters: <ul style="list-style-type: none"> • T1 Ack • T2 S Frame • T3 Test • k • w • Allowed Clients IP Mask • TCP Port Active Sector / Channel By Sector: <ul style="list-style-type: none"> • ASDU Address • Event: Scan Enable/TimeFormat • Period: Background/Cyclic/Event Scan
Supported Point Types	Monitor/Control/Parameter
Supported Monitor Mode ASDU Types	M_SP - Single Point M_DP - Double Point M_ST - Regulating Step Point M_BO - Bitstring Point M_ME_NA - Measured Point (normalized) M_ME_NB - Measured Point (scaled) M_ME_NC - Measured Point (short floating) M_ME_ND - Measured Point (normalized without QDS)
Supported Control Mode ASDU Types	C_SC_xA - Single Command Point C_DC_xA - Double Command Point C_RC_xA - Regulating Step Command Point C_BO_xA - Bitstring Command Point C_SE_xA - Set Normalized Command Point C_SE_xB - Set Scaled Command Point C_SE_xC - Set Short Floating Command Point



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Screenshots

Control Settings | IEC104 <--> Modbus | System Monitoring

Modbus Master 00

Status: Running

Reset [Pause]

Hot Reset [Cold Reset]

Configuration

Parameter	Type	Value
IEC1042Modbus		
IEC104		
Channel	STR	Socket 01
Primary		
Auxiliary	BOOL	FALSE
Channels		
Socket 01		
104 Link		
T1 Ack	U32	15000
T2 S Frame	U32	15000
T3 Test	U32	20000
k	U32	12
w	U32	8
Sectors		
Sector 03		
ASDU Address	U32	3
Event		
Scan Enable		
M-DP	BOOL	TRUE
M-ME-NC	BOOL	TRUE
M-SP	BOOL	TRUE
Time Format		
M-DP	STR	Time 56

Exit

Control Settings | IEC104 <--> Modbus | System Monitoring

Table

PointType	ASDU	GroupType	IOA	Name	BackIOA	Select	TimeFormat	TransMode	Threshold	LowLimit
Monitor	M_SP	000000001	31203				CP56Time2A	Cyclic		0
Monitor	M_SP	000000011	31205				CP56Time2A	Cyclic		0
Monitor	M_SP	000000011	31206				CP56Time2A	Cyclic		0
Monitor	M_SP	000000011	31207				CP56Time2A	Cyclic		0
Monitor	M_SP	000000011	31208				CP56Time2A	Cyclic		0
Monitor	M_SP	000000011	31204				CP56Time2A	Cyclic		0
Monitor	M_SP	000000101	31210				CP56Time2A	Cyclic		0
Monitor	M_SP	000000101	31211				CP56Time2A	Cyclic		0
Monitor	M_SP	000000101	31212				CP56Time2A	Cyclic		0
Monitor	M_SP	000000101	31213				CP56Time2A	Cyclic		0
Monitor	M_SP	000000101	31209				CP56Time2A	Cyclic		0
Monitor	M_SP	000000001	31215				CP56Time2A	Cyclic		0
Monitor	M_SP	000000001	31214				CP56Time2A	Cyclic		0
Monitor	M_SP	000000001	31200				CP56Time2A	Cyclic		0
Monitor	M_SP	000000001	31201				CP56Time2A	Cyclic		0



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Hardware Specifications

Physical Characteristics	
Dimensions	178.1 mm × 87.3 mm × 64.3 mm (7.01 in. × 3.44 in. × 2.63 in.)
Weight	692 g (24.39 oz)
Temperature rating	85 °C
Network	
Network interface (X2)	10Base-T, 100Base-T, 1000Base-T Ethernet
Compatibility	IEEE 802.3
Communication rates	10 Mbps, 100 Mbps, 1,000 Mbps autonegotiated, half/full-duplex
Power Requeriments	
Voltage input range	9 VDC to 30 VDC
Reverse-voltage protection	30 VDC maximum
Maximum power input, with four C Series modules	18 W
Maximum power input, without C Series modules	14 W