

Anybus[®] X-gateway[™]

Application Note Common Parameters Configurations for J1939 Equipment

Doc. Id. SCM-1200-035

Revision 1.00

Nov 8th 2009



HMS Industrial Networks AB
Box 4126
300 04 Halmstad
Sweden

Phone: +46 35 172900 FAX: +46 35 172909

www.anybus.com

TABLE OF CONTENTS

1.	OVERVIEW.....	1
2.	CONFIGURATIONS	1
3.	USING THE COMMON PARAMETERS CONFIGURATION.....	2
3.1	CONFIGURE THE X-GATEWAY MODULE	2
3.2	CONNECT THE X-GATEWAY TO THE CONTROLLER.....	2
3.3	CONNECT THE X-GATEWAY TO THE J1939 NETWORK	2
3.4	MONITORING THE J1939 DATA	2
4.	COMMON PARAMETERS CONFIGURATION NAME AND ADDRESS.....	3
5.	TRANSMITTED PARAMETER DATA	4
6.	RECEIVED PARAMETER DATA.....	4
7.	SUPPORT	7
7.1	PRODUCT ASSISTANCE	7
7.2	CONTACT INFORMATION	8

1. Overview

The “Common Parameters” configurations are designed to provide a configuration that will cover most of the typically monitored J1939 parameters. The configuration provides monitoring of a collection of commonly used J1939 parameters that are available in most heavy duty equipment systems.

2. Configurations

The collection of configurations provides a file for each type of X-gateway.

The specific parameters that are monitored in the configurations are listed in the Produced and Consumed Parameter Data sections at the end of this document.

The following table lists the configuration files and the type of X-gateway and controller required by each.

Configuration File	Description	BW Type	Controller Type
CommonParmEIP.cfg	Common J1939 parameters configuration for EtherNet/IP	AB7665	ControlLogix, Pyramid Solutions EIPScan, or other EtherNet/IP scanner
CommonParmTCP.cfg	Common J1939 parameters configuration for Modbus TCP	AB7665	Modbus TCP master (ethernet)
CommonParmRTU.cfg	Common J1939 parameters configuration for Modbus RTU	AB7612	Modbus RTU master (rs485)
CommonParmPDP.cfg	Common J1939 parameters configuration for PROFIBUS DP	AB7615	PROFIBUS DP master

3. Using the Common Parameters Configuration

Running a X-gateway with a Common Parameters configuration is as simple as loading the configuration into a X-gateway module and establishing communications to it from the required controller.

3.1 Configure the X-gateway Module

1. Power on the X-gateway module.
2. Connect the serial connector to a PC and start BWConfig.
3. Load the desired configuration file into BWConfig using the File->Open menu.
4. Set the master network configuration (Modbus, Ethernet, or PROFIBUS) as required for the X-gateway to communicate with the controller being used to monitor the system.
5. Download the configuration into the X-gateway.

3.2 Connect the X-gateway to the Controller

1. Make any network connections required to attach the X-gateway to the controller network (Modbus, Ethernet, or PROFIBUS).
2. Establish communications with the X-gateway from the controller. Refer to the *Interfacing to J1939 with... .pdf* document for examples and tips on how to set up communications for the controller that is being used.

3.3 Connect the X-gateway to the J1939 Network

1. Make the network connections required to attach the X-gateway to the J1939 network.
2. Verify that the module is online with no errors (Green J1939 status LED and no errors shown in BWConfig).

3.4 Monitoring the J1939 Data

1. Using the controller, monitor the input data at the data table locations or register addresses specified in the Consumed Parameter Data section below. This will be the data that has been transmitted in the associated PGN messages by the devices on the J1939 network.

4. Common Parameters Configuration NAME and Address

The J1939 NAME and address is set in the Common Parameters configuration to allow the X-gateway to join the J1939 network with little probability of address contention with other devices. The configuration uses Arbitrary Address capability with 3 addresses.

NAME

Industry Group	0 (Global)
Function	255
Function Instance	1
Vehicle System	0
Vehicle System Instance	1
ECU Instance	1
Manufacturer Code	2047
Identity Number	255
Arbitrary Address Capable	Yes

Network Addresses

128
129
130

5. Transmitted Parameter Data

The Common Parameters configuration does not include any transmitted parameters.

6. Received Parameter Data

The following table lists the parameters that will be received by the Common Parameters configuration along with the data table locations and register addresses where the parameter data can be monitored by the various controllers.

Parameter	Modbus Register AB7612	Modbus Register AB7665	Data Table Offset AB7615 (bytes)	Data Table Offset AB7665-EIP (bytes)	PGN	Offset (byte.bit)	Length (byte.bit)	Rx Timeout	Scaling
Percent Load at Current Speed	30001	30003	0	4	61443	2.0	1.0	0	1 %/bit 0 % offset
Engine Speed	30002	30004	2	6	61444	3.0	2.0	0	0.125 RPM/bit 0 RPM offset
Actual Engine Percent Torque	30003	30005	4	8	61444	2.0	1.0	0	1 %/bit -125 % offset
Fan Speed	30004	30006	6	10	65213	0.0	1.0	0	0.4 %/bit 0 % offset
Total Engine Hours	30005-30006	30007-30008	8	12	65253	0.0	4.0	5s	0.05 hours/bit 0 hours offset
Total Fuel Used	30007-30008	30009-30010	12	16	65257	4.0	4.0	2s	0.5 L/bit 0 L offset
Engine Coolant Temperature	30009	30011	16	20	65262	0.0	1.0	0	1 DegC/bit -40 DegC offset
Fuel Temperature	30010	30012	18	22	65262	1.0	1.0	0	1 DegC/bit -40 DegC offset
Engine Oil Temperature	30011	30013	20	24	65262	2.0	2.0	0	0.03125 DegC/bit -273 DegC offset
Engine Intercooler Temperature	30012	30014	22	26	65262	6.0	1.0	0	1 DegC/bit -40 DegC offset

Anybus® X-gateway™ Application Note

Parameter	Modbus Register AB7612	Modbus Register AB7665	Data Table Offset AB7615 (bytes)	Data Table Offset AB7665-EIP (bytes)	PGN	Offset (byte.bit)	Length (byte.bit)	Rx Timeout	Scaling
Engine Oil Level	30013	30015	24	28	65263	2.0	1.0	0	0.4 %/bit 0 % offset
Coolant Level	30014	30016	26	30	65263	7.0	1.0	0	0.4 %/bit 0 % offset
Fuel Delivery Pressure	30015	30017	28	32	65263	0.0	1.0	0	4 kPa/bit 0 kPa offset
Engine Oil Pressure	30016	30018	30	34	65263	3.0	1.0	0	4 kPa/bit 0 kPa offset
Coolan Pressure	30017	30019	32	36	65263	6.0	1.0	0	2 kPa/bit 0 kPa offset
Throttle Position	30018	30020	34	38	65266	6.0	1.0	0	0.4 %/bit 0 % offset
Fuel Rate	30019	30021	36	40	65266	0.0	2.0	0	0.05 L/hr / bit 0 L/hr offset
Barometric Pressure	30020	30022	38	42	65269	0.0	1.0	0	0.5 kPa/bit 0 kPa offset
Ambient Air Temperature	30021	30023	40	44	65269	3.0	2.0	0	0.03125 DegC/bit -273 DegC offset
Air Inlet Temperature	30022	30024	42	46	65269	5.0	1.0	0	1 DegC/bit -40 DegC offset
Boost Pressure	30023	30025	44	48	65270	1.0	1.0	0	2 kPa/bit 0 kPa offset
Intake Manifold Temperature	30024	30026	46	50	65270	2.0	1.0	0	1 DegC/bit -40 DegC offset
Air Filter Differential Pressure	30025	30027	48	52	65270	4.0	1.0	0	0.05 kPa/bit 0 kPa offset
Exhaust Gas Temperature	30026	30028	50	54	65270	5.0	2.0	0	0.03125 DegC/bit -273 DegC offset
Electric Potential Voltage	30027	30029	52	56	65271	4.0	2.0	0	0.05 V/bit 0 V offset

Parameter	Modbus Register AB7612	Modbus Register AB7665	Data Table Offset AB7615 (bytes)	Data Table Offset AB7665-EIP (bytes)	PGN	Offset (byte.bit)	Length (byte.bit)	Rx Timeout	Scaling
Battery Potential Voltage (switched)	30028	30030	54	58	65271	6.0	2.0	0	0.05 V/bit 0 V offset
Transmission Oil Pressure	30029	30031	56	60	65272	3.0	1.0	0	16 kPa/bit 0 kPa offset
Transmission Oil Temperature	30030	30032	58	62	65272	4.0	2.0	0	0.03125 DegC/bit -273 DegC offset
Water In Fuel Indicator	30031	30033	60	64	65279	0.0	0.2	0	00 = No 01 = Yes

The data table offsets are set up on 16-bit word boundaries to line up easily with Modbus register addresses. Parameter data that is less than 2 bytes in length will be stored in the first byte of the word. Parameter data less than 1 byte in length will be stored in the low order bits of the first byte.

The parameter data will hold the last value that was received from the J1939 network. If the associated PGN message has not been received, the data will remain at 0. (with the exception of Engine Hours and Total Fuel Used)

The Engine Hours and Total Fuel Used parameters are in PGNs that are not periodically broadcast; they must be requested. The Rx Timeout field has been set to 5 and 2 seconds respectively, which will be the time between requests for the data. If the data is not received, the data will be set to 0xFFFF. This value can be used as an indication that the X-gateway is not communicating with the ECU.

7. Support

7.1 *Product Assistance*

HMS Sweden (Head Office)

E-mail: support@hms-networks.com
Phone: +46 (0) 35 - 17 29 20
Fax: +46 (0) 35 - 17 29 09
Online: www.anybus.com

HMS North America

E-mail: us-support@hms-networks.com
Phone: +1-312-829-0601
Toll Free: +1-888-8-Anybus
Fax: +1-312-738-5873
Online: www.anybus.com

HMS Germany

E-mail: ge-support@hms-networks.com
Phone: +49-721-96472-0
Fax: +49-721-964-7210
Online: www.anybus.com

HMS Japan

E-mail: jp-support@hms-networks.com
Phone: +81-45-478-5340
Fax: +81-45-476-0315
Online: www.anybus.com

HMS China

E-mail: cn-support@hms-networks.com
Phone: +86 10 8532 3023
Online: www.anybus.com

HMS Italy

E-mail: it-support@hms-networks.com
Phone: +39 039 59662 27
Fax: +39 039 59662 31
Online: www.anybus.com

HMS France

E-mail: mta@hms-networks.com
Phone: +33 (0) 3 89 32 76 41
Fax: +33 (0) 3 89 32 76 31
Online: www.anybus.com

7.2 Contact Information

HMS Industrial Networks AB
Box 4126
300 04 Halmstad
Sweden

Phone: +46 35 172900
Fax: +46 35 172909

<http://www.anybus.com>