INDUSTRIAL CONTROL COMMUNICATIONS, INC.

MSA Chillgard Monitor Driver Manual

October 30, 2014

TABLE OF CONTENTS

1 MSA Chillgard Monitor

***Note** that this document <u>does not apply</u> to Chillgard L-series applications that use the Modbus Sniffer driver configuration.*

1.1 Overview

This driver supports the MSA Chillgard Monitor protocol. Some notes of interest are:

- Enables non-intrusive monitoring of gas concentration and alarm information for MSA's Chillgard LC, LE, and RT monitors, and Chemgard monitor.
- No configuration necessary: data is automatically mapped into the database upon selection of the protocol. Refer to section 1.3 for more information.
- Network characteristics are fixed at 19200 baud, 8 data bits, 1 start bit, 1 stop bit and no parity.
- May be connected along with an MSA Remote Display module or Remote Relay module.
- Gas concentration values are automatically scaled to preserve all digits shown on the display.

1.2 Connections

This section describes the typical connections used for a Millennium Series gateway.

- The gateway can be powered from the 12V supply on the Chillgard RT and Chemgard monitors by connecting J14 terminals 1 (+12V) and 3 (GND) to terminals "POWER" and "GND" of the gateway, respectively.
- Connect the MSA equipment to the gateway's RS-485 port by using twisted-pair cable connected as shown in Figure 1 and Figure 2. Connect the "+" ("*RS-485 To Optional Relay Module*" terminal block for LC and LE) or "+ / A" (J15 terminal 2 or 4 for RT and Chemgard) terminal of the MSA equipment to terminal "A" of the gateway, the "-" ("*RS-485 To Optional Relay Module*" terminal block for LC and LE) or "- / B" (J15 terminal 1 or 3 for RT and Chemgard) terminal to terminal "B", and the ground terminal "G" ("*RS-485 To Optional Relay Module*" terminal block for LC and LE) or "GND" (J14 terminal 3 for RT and Chemgard) terminal to terminal "GND". Also install jumper wires connecting terminal "A" to terminal "Y", and terminal "B" to terminal "Z" on the gateway.

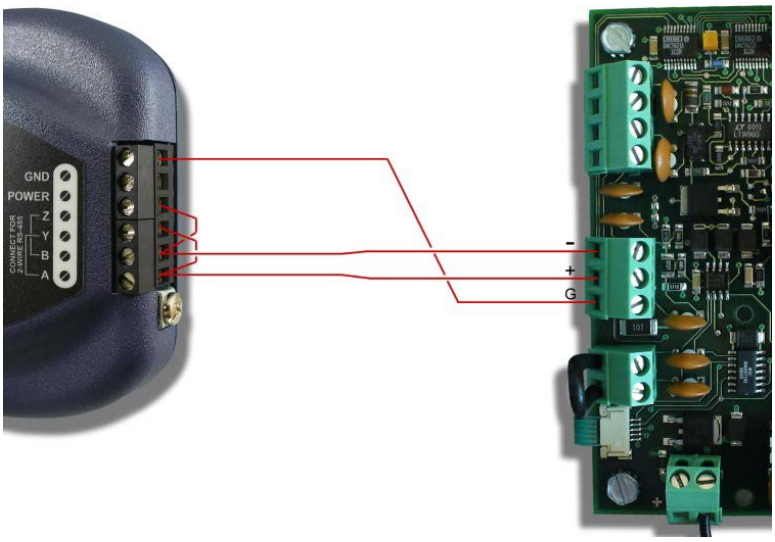

Figure 1: Chillgard LC/LE to RS-485 Port Connections

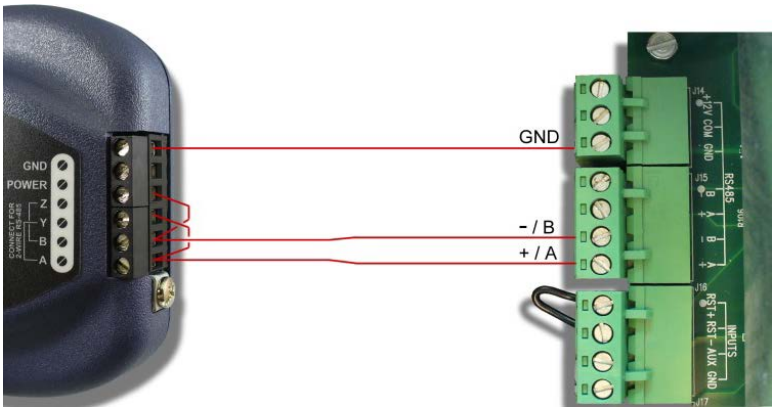

Figure 2: Chillgard RT/Chemgard to RS-485 Port Connections

1.3 Data Mapping

This section describes the non-configurable data mapping for the Chillgard Monitor protocol. Each parameter is a 16-bit word containing either data values or bit-wise data. Note that for all bit-wise parameters, bits not described in the parameter's bit mapping are to be considered reserved. Table 1 describes the layout of this information in the internal database.

Table 1: Chillgard Database Mapping

Database Address	+0	+2	+4	+6
0	I/O State	Alarm Data	Audio Preferences	Status
8	S1 Gas Number	S1 Gas Concentration	S1 Alarm State	Reserved
16	S2 Gas Number	S2 Gas Concentration	S2 Alarm State	Reserved
24	S3 Gas Number	S3 Gas Concentration	S3 Alarm State	Reserved
32	S4 Gas Number	S4 Gas Concentration	S4 Alarm State	Reserved
40	S5 Gas Number	S5 Gas Concentration	S5 Alarm State	Reserved
48	S6 Gas Number	S6 Gas Concentration	S6 Alarm State	Reserved
56	S7 Gas Number	S7 Gas Concentration	S7 Alarm State	Reserved
64	S8 Gas Number	S8 Gas Concentration	S8 Alarm State	Reserved

I/O State

This parameter is the I/O state of the monitor module overall. It may have the following values:

0 – Warmup
1 – Ready
2 – Trouble
3 – Cal / Setup

Alarm Data

This parameter provides alarm information for the monitor module overall. This is a bit-wise parameter with the following bit mapping:

Bit 6 – Audio On
Bit 7 – Alarm Latched

Audio Preferences

This parameter provides audio and latching preferences that are currently configured for the monitor module. This is a bit-wise parameter with the following bit mapping:

Bit 0 – Latching Caution Relay
Bit 1 – Latching Warning Relay
Bit 2 – Latching Alarm Relay
Bit 3 – Audio Triggers on Caution
Bit 4 – Audio Triggers on Warning
Bit 5 – Audio Triggers on Alarm
Bit 6 – Audio Triggers on Trouble
Bit 7 – Audio Triggers on Auxiliary

Status

This parameter provides status information generated by the driver containing the communication status to the monitor module and validity of concentration values. This is a bit-wise parameter with the following bit mapping:

Bit 0 – S1 Valid
Bit 1 – S2 Valid
Bit 2 – S3 Valid
Bit 3 – S4 Valid
Bit 4 – S5 Valid
Bit 5 – S6 Valid
Bit 6 – S7 Valid
Bit 7 – S8 Valid
Bit 8 – Com Error (1= driver not receiving transmissions from monitor)

Note that bits #0..#7 of the status parameter will be "1" when the monitor is configured to sample the indicated sensor, and is sending the associated concentration values and gas type to the driver. This occurs only when the monitor is showing the home screen on its display (i.e. if the user navigates away from the monitor's home screen, these bits will become "0").

Sx Gas Number

This parameter, one for each of 8 samples, is the numerical encoding of the gas type currently being sampled for that point. Refer to Table 2 for a definition of the gas number encoding. Note that the gas number value will not be updated in the database if the corresponding sensor status bit is not valid (e.g. if the home screen is currently not being display on the monitor).

Table 2: Chillgard Gas Number Definitions

Gas Number	Gas Type	Gas Number	Gas Type	Gas Number	Gas Type
0	UNDEF	51	R-1132a	102	M-Xylene
1	R-11	52	Ethylene Oxide	103	P-Xylene
2	R-12	53	Cyclopentane	104	N-Hexane
3	R-13	54	Ethanol	105	N-Pentane
4	R-13B1	55	Trichloroethylene	106	Hex-Fluor-Pro
5	R-14	56	Dowtherm J Diethyl Benzene	107	Tetra-Fl-Eth
6	R-22	57	Xylene - Meta Xylene - Ortho Xylene - Para	108	Ether
7	R-23	58	Methylene Chloride	109	Halon 1301
8	R-32	59	Ethane	110	Halon 1211
9	R-113	60	Acetone	111	12-Dicl Ethane
10	R-114	61	Methyl Ethyl Ketone	112	Methyl Iodide
11	R-115	62	N-Hexane	113	NF3

Gas Number	Gas Type	Gas Number	Gas Type	Gas Number	Gas Type
12	R-123	63	Methonal	114	Chloroform
13	R-124	64	Nitrous Oxide	115	Phosgene
14	R-125	65	Perchloroethylene Tetachloroethylen	116	Hydrazine
15	R-134a	66	Perfluoromethyl Vinyl Ether	117	DMEA
16	R-141b	67	Sulfur Hexafluoride	118	Ethrane
17	R-142b	68	Methane	119	Forane
18	R-143a	69	Butane	120	Halothane
19	R-152a	70	Propane	121	THF
20	R-227	71	N-Pentane	122	Methyl Methacrylate
21	R-236fa	72	Styrene	123	HFE 7100
22	R-401A	73	Ethyl Benzene	124	HFE 347E
23	R-402A	74	Propylene Oxide	125	PGMEA
24	R-402B	75	Any solvent	126	Isceon 89
25	R-403A	76	Benzene	127	PF 5050
26	R-403B	77	Isopropanol	128	Solkane 365/227
27	R-404A	78	Methyl Formate	129	Perfluorohexane
28	R-407A	79	Ethylene	130	Vinyl Chloride
29	R-407B	80	13 Butadiene	131	Vinyl Fluoride
30	R-407C	81	Propanal	132	Ethyl Acetate
31	R-408A	82	Acetonitrile	133	C4F10
32	R-409A	83	Acrylonitrile	134	C4F8
33	R-409B	84	Carbon Tetrachloride	135	C5F8
34	R-410A	85	Heptane	136	CH3F
35	R-410B	86	Triethylamine	137	C4F6
36	R-500	87	Dimethylamine	138	PGlycol
37	R-502	88	Methyl Isobutyl Ketone	139	IButane
38	R-507A	89	1,1,2 Trichloroethane	140	M.Morph
39	R-508A	90	Ammonia	141	E.Ether
40	R-508B	91	1-Butyle Acetate	142	Nitrous Oxide
41	R-717	92	Methyl Methacrylate	143	Difluoromethane
42	CO	93	Toluene	144	R134A
43	CO2	94	1,1,1 Trichloroethane	145	Dimethylacetamide

Gas Number	Gas Type	Gas Number	Gas Type	Gas Number	Gas Type
44	AMMONIA	95	Volatile Organic Compound	146	Acetic Acid
45	REFRIGS	96	Jet Fuel	147	Acetylene
46	R-143c	97	Hexene	148	Formic Acid
47	R-218	98	1-But Acetate	149	Methyl Amyl Ketone
48	R-245fa	99	111 TCE	150	Methyl Propyl Ketone
49	R-225cb	100	112 TCE		
50	R-1234yf	101	O-Xylene		

Sx Gas Concentration

This parameter, one for each of 8 samples, is the current gas concentration sampled for that point. Note that the gas concentration value will not be updated in the database if the corresponding sensor status bit is not valid (e.g. if the home screen is currently not being display on the monitor).

The gas concentrations are automatically scaled depending on how they are displayed. For example, if the value displayed is 21.4 ppm, the value will be scaled by 10 resulting in a value of 214 in the database. If the value displayed is 0.67%, the value will be scaled by 100 resulting in a value of 67 in the database.

Sx Alarm State

This parameter, one for each of 8 samples, is the alarm state of the point. It is a bit-wise parameter with the following bit mapping:

Bit 0 – Caution
Bit 1 – Warning
Bit 2 – Alarm

ICC

INDUSTRIAL CONTROL COMMUNICATIONS, INC.

1600 Aspen Commons, Suite 210
Middleton, WI USA 53562-4720
Tel: [608] 831-1255 Fax: [608] 831-2045

http://www.iccdesigns.com

Printed in U.S.A