

Wiring Diagrams for CAN Communication in Control Panels

Models ASC-E2469600, ASC-E2469620 and EICS

Use this document as quick guide for ASC, EICS and M-Link equipped panels interconnected by CAN and RS485 network for sharing data. See sections at the back of manual for additional details of specific components.

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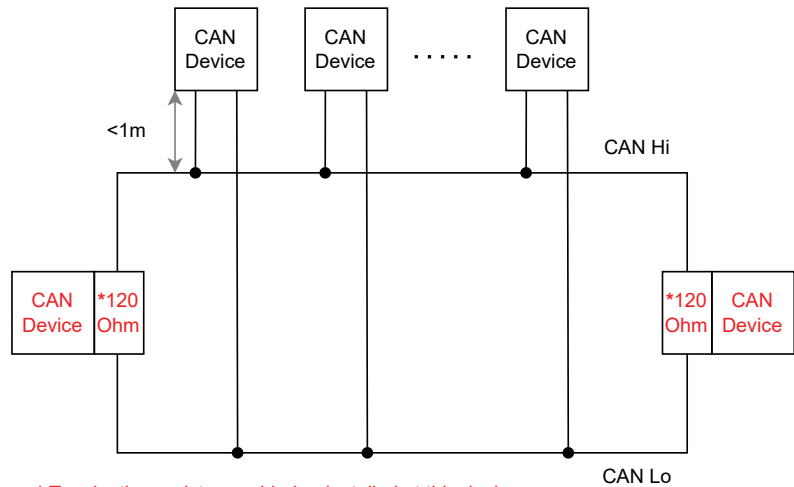
CAN Settings and Wire Diagrams

CAN Topology

Follow these guidelines

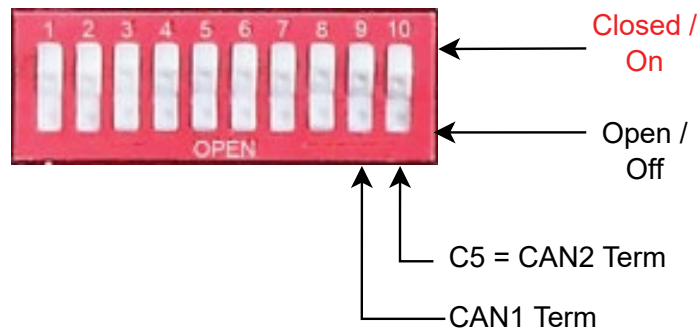
- Max bus length @250kbit/s = 656 ft (200 m), @500kbit/s = 328 ft (100 m), @1Mbit/s = 131 ft (40 m)
- Stubs/branches from main bus should be limited to less than 3.3 ft. (1 m)
- Wiring between devices shall be daisy chain from device to device
- Termination resistor must be installed each end of bus
- Conductors should be twisted, 120 ohm characteristic impedance

Cable in Panels = Belden 3105	EICS Emission/ Suction Key Colors
Blue = CAN Hi	Yellow = CAN Hi
White/Blue = CAN Lo	Green = CAN Lo



CAN Termination Settings

C5-1, MX4-R2, MX5-R2, MPC5



Other device termination settings

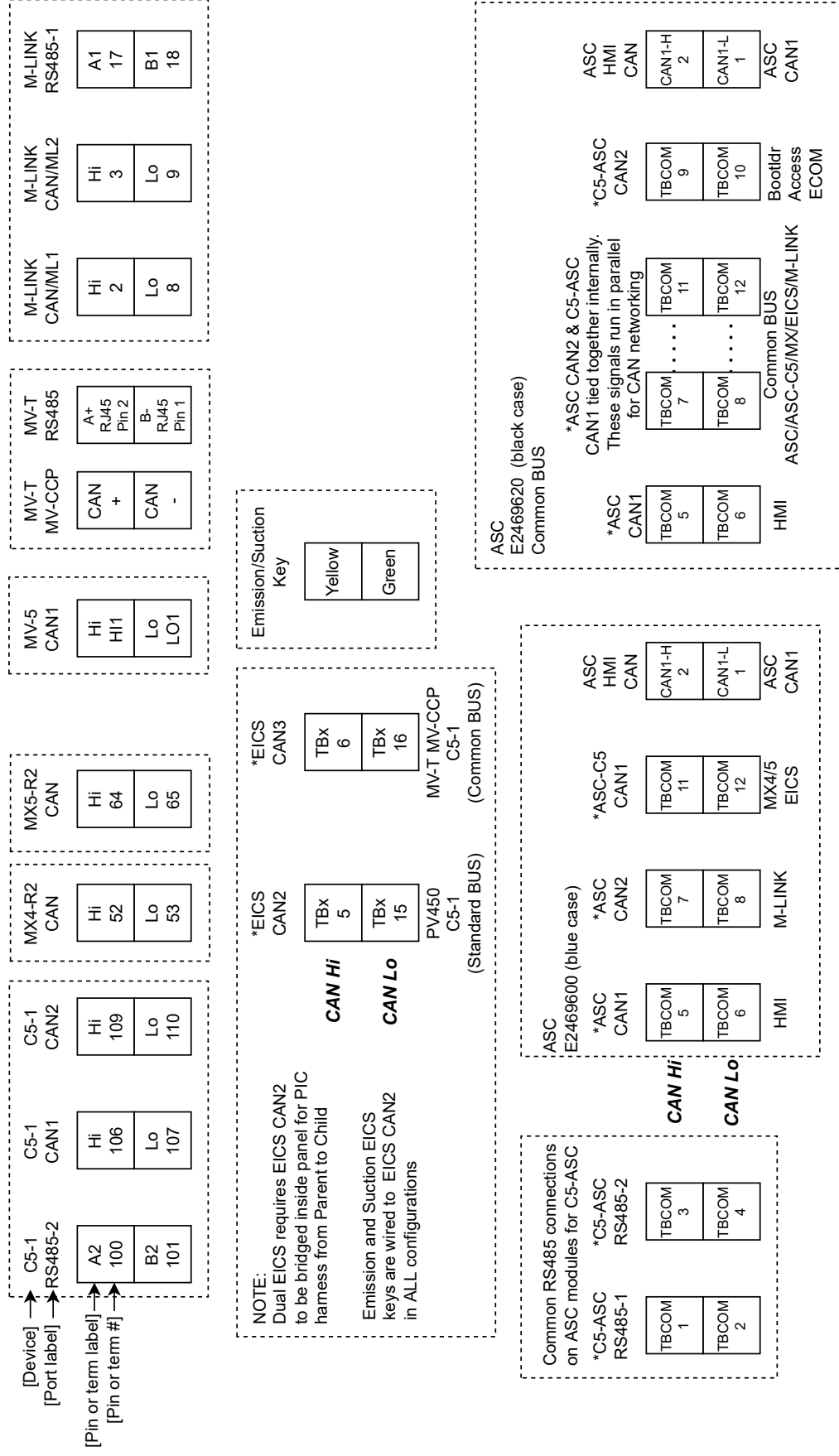
- C5-ASC CAN1 E2469600 always on
- C5-ASC CAN1 E2469620 = software selectable
- MV-5 = software selectable
- MV-T w/ MV-CCP = switch setting
- EICS CAN2 & 3 = always on
- EICS Emission / Suction key = none
- M-Link = set by configuration file

CAN Addresses

Each device on a particular bus must have a unique address

- EICS Parent CAN2 & 3 = fixed at 0
- EICS Child CAN2 & 3 = fixed at 1
- MV-5 = arbitrary (auto negotiated) in SR0.5. SR1 = 220
- MX = arbitrary (auto negotiated) in SR0.5. SR1 = 220+DIP sw address
- C5, PV450, MV-T w/ MV-CCP = fixed 249
- M-Link = set by configuration file (type 248 or 249, watch for conflict with other 249 devices)
- MPC5 = fixed 240
- ASC = fixed 241

Device Communication Termination Points

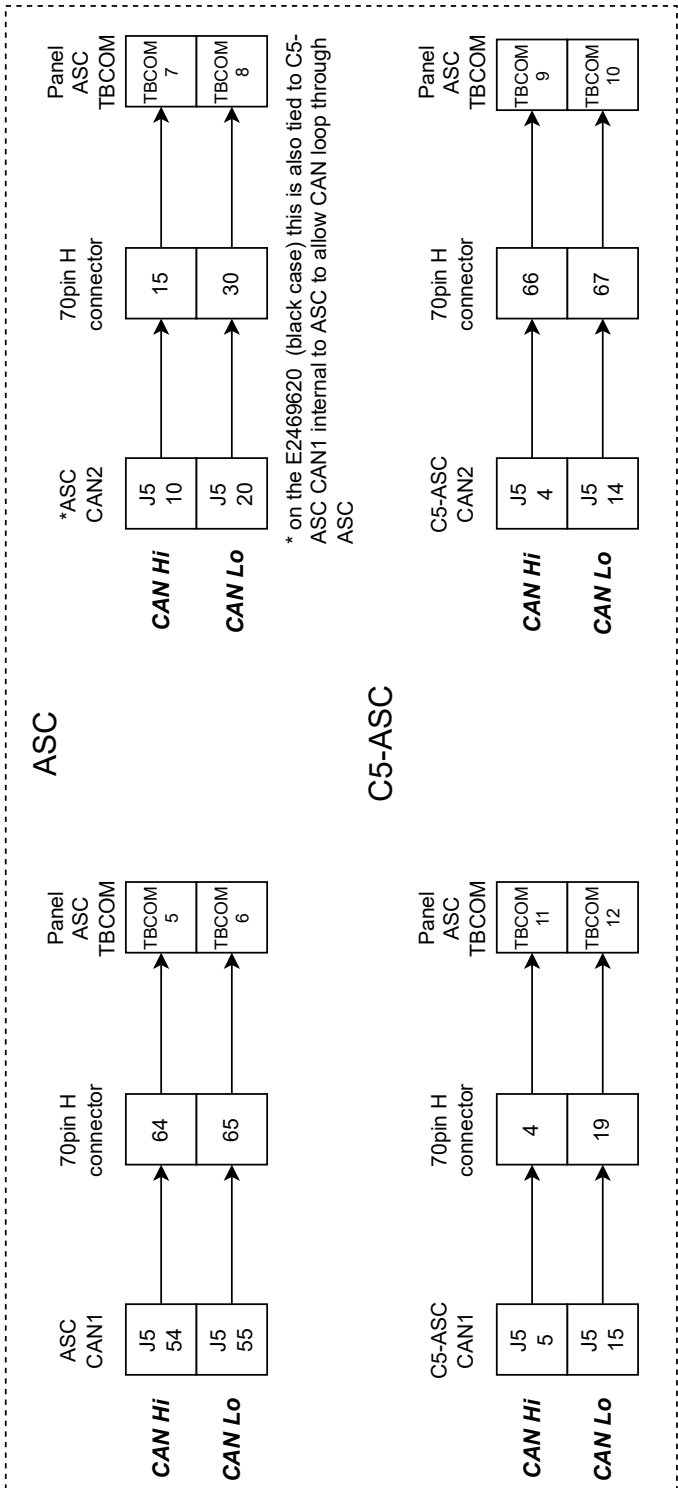
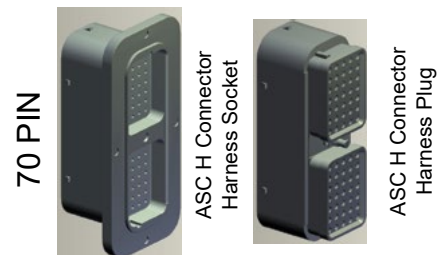
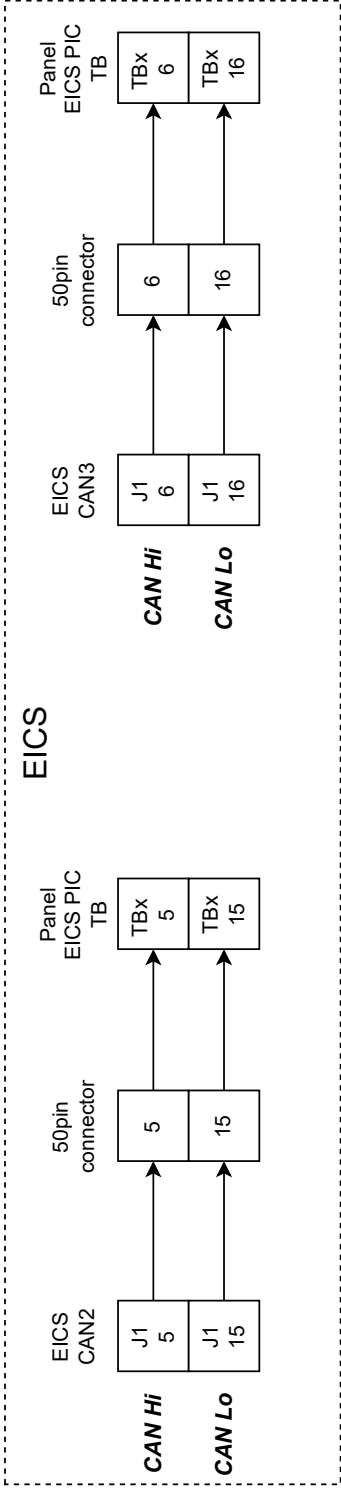
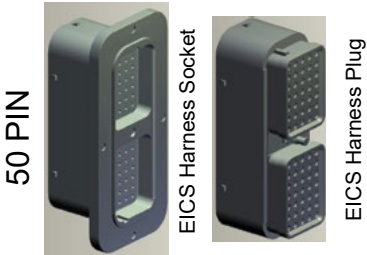


*Current production EICS (50 pin) and ASC (70 pin) harness pin plugs and sockets are mounted in the panel enclosure with wire labels reflecting the multi-pin connection.

Data shown on this page depicts final terminal block field wiring point in the panel. Refer to the Harness Cross Reference pages for the extrapolated view of the termination from the device to the panel terminals.

NOTE: The ASC panel terminal designations may not accurately represent your panel wiring. Always consult as-built drawings before attempting to service panels.

EICS and ASC Harness Communication Resource Cross Reference

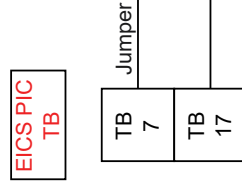


NOTE: The ASC panel terminal designations may not accurately represent your panel wiring and 70-pin connector may not be present. Always consult as-built drawings before attempting to service panels.

EICS Cummins Engine Specific CAN-3 Bit Rate Selection

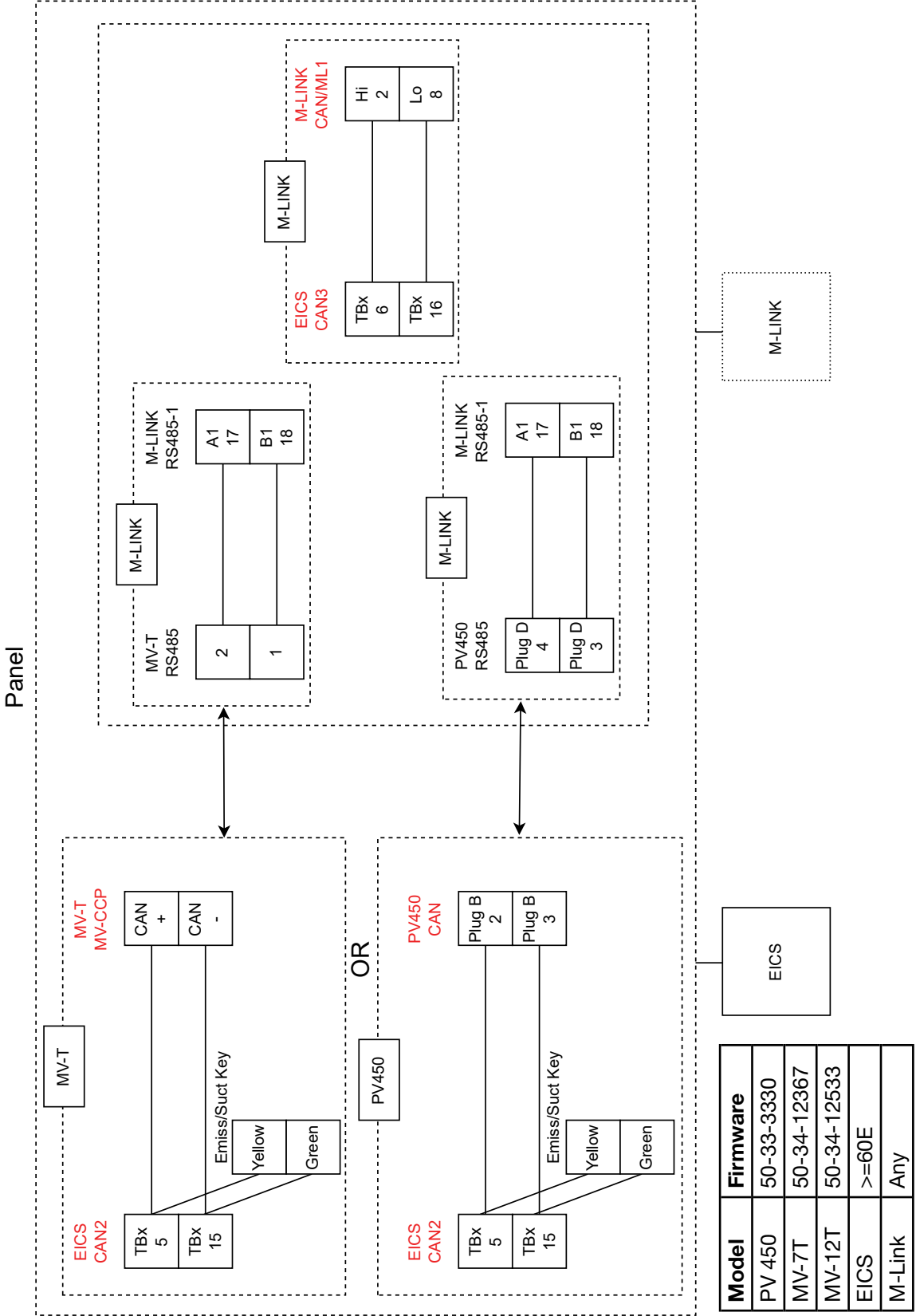
- 1) New Cummins engine mot files Rev >=92 operate at 1000 Mbit CAN (default).
- 2) Use current production panels with C5 Series SR1.0 (50333921) firmware and C5-ASC model E2469620: A jumper is required in the control panel between EICS PIC TB7 and TB17 and must be added. The jumper switches the EICS CAN-3 port to 500k for use on these systems.
- 3) Jumper not installed for legacy C5 Series SR0.5 (50333920) or C5-ASC model E2469600.

Panel



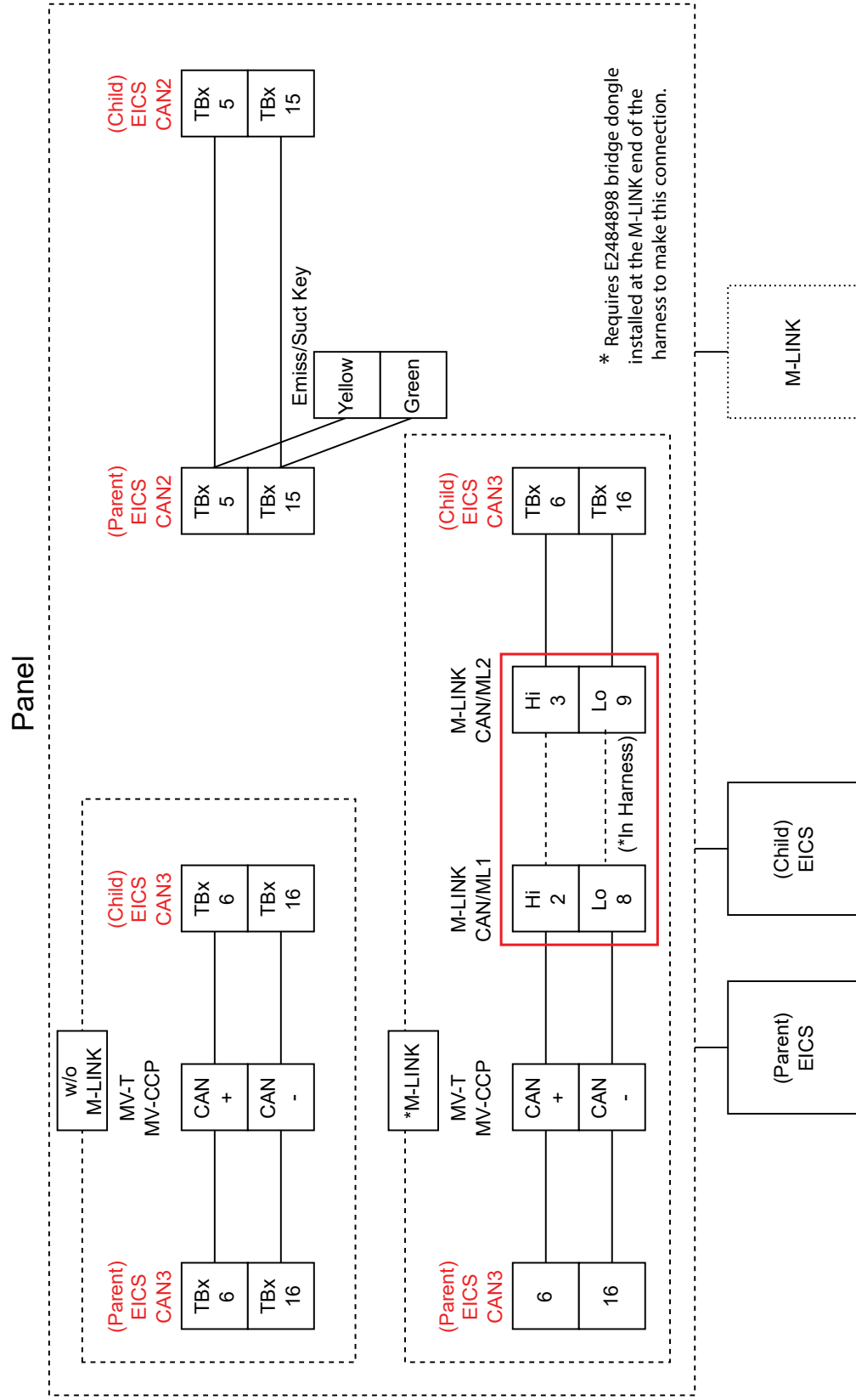
M-View Touch as HMI for Single Bank EICS Engine

MV-T with MV-CCP communication card
EICS (Single) * CAN2 250Kbit/s * CAN3 1Mbit/s (changing to 500Kbit/s in mot 90J)
(optional) M-Link * CAN to EICS CAN3 or RS485 to Display



M-View Touch as HMI for Dual Bank EICS Engine

MV-T with MV-CCP communication card
EICS (Parent/Child) * CAN2 250Kbit/s * CAN3 1Mbit/s (changing to 500Kbit/s in mot 90J)
(optional) M-Link * CAN to EICS CAN3



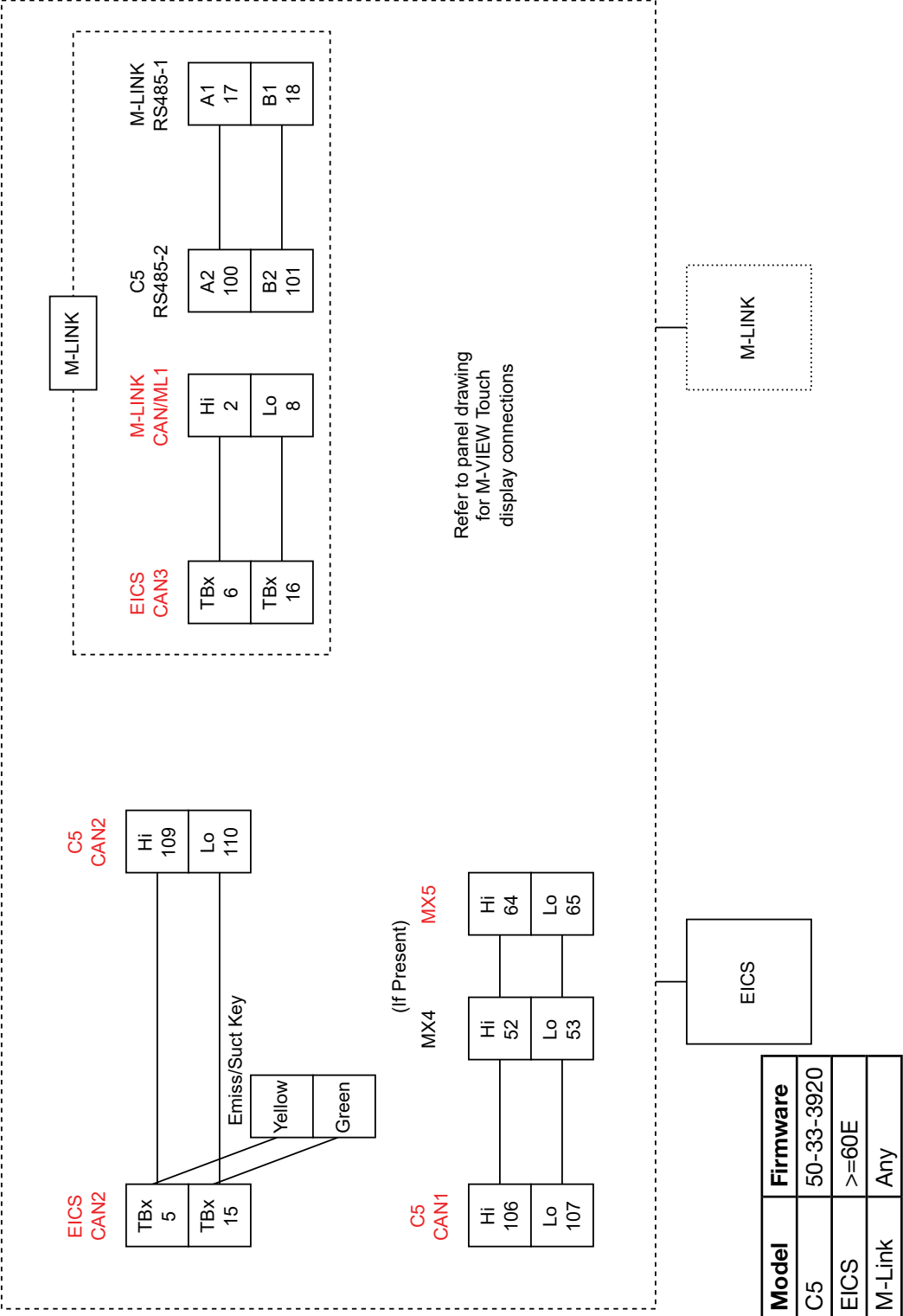
Model	Firmware
MV-7T	50-34-12367
MV-12T	50-34-12533
EICS	>= 84D required for M-Link CAN connection, or use RS485 display options for M-Link on previous page
M-Link	>= 5.1.10948 for M-Link CAN

Standard Bus

C5 Control Panel with Single Bank EICS Engine and Additional Communication Options

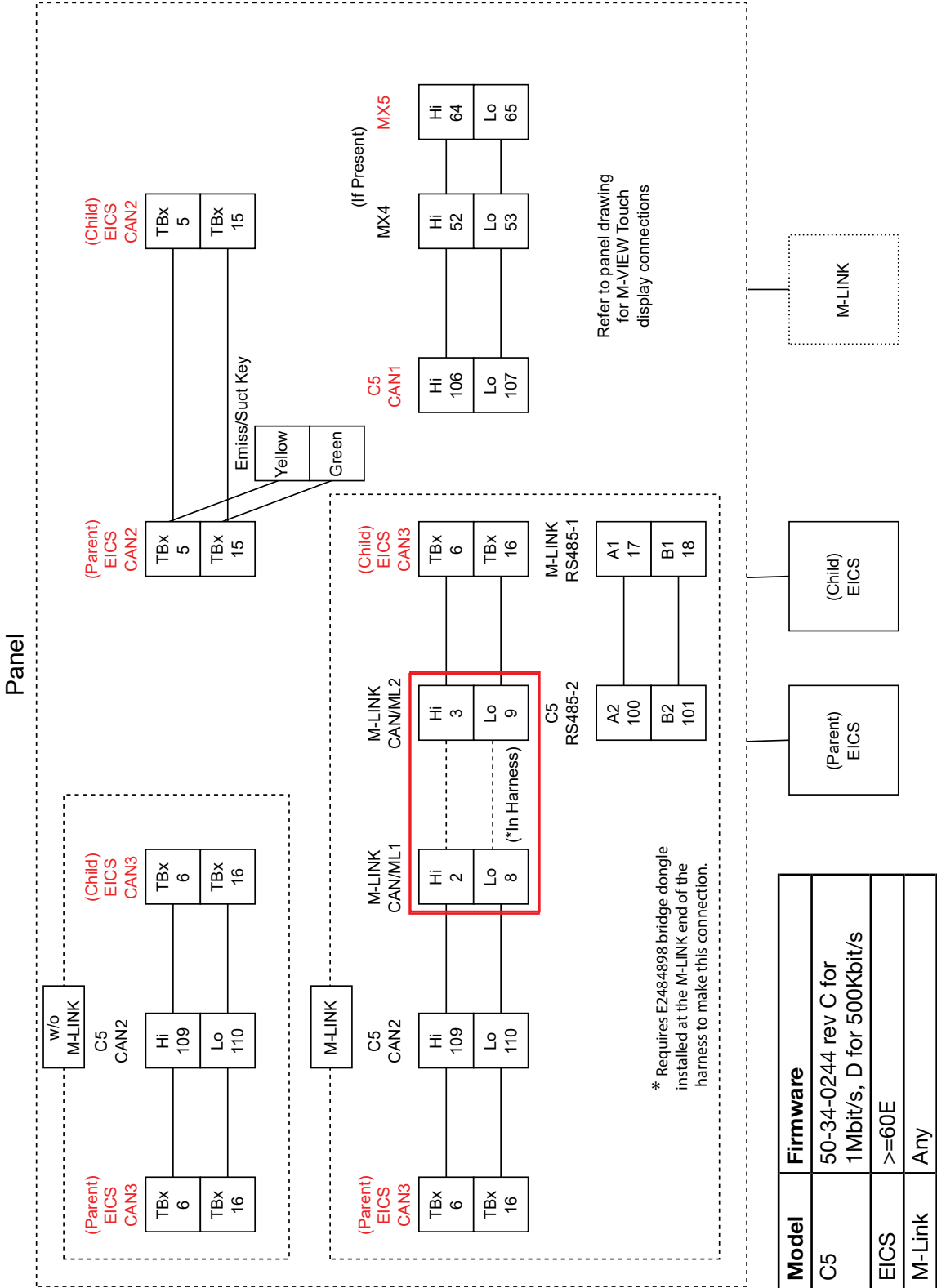
SR0.5 C5 * Standard Bus * CAN2 250Kbit/s
EICS (Single) * CAN2 250Kbit/s * CAN3 1Mbit/s (changing to 500Kbit/s in mot 90J)
(optional) M-Link * RS485 to C5 * CAN to EICS CAN3

Panel



C5 Control Panel with Dual Bank EICS Engine and Additional Communication Options

SR0.5 C5 * Standard Bus * Special configurable firmware CAN2 1Mbit/s
EICS (Parent/Child) * CAN2 250Kbit/s * CAN3 1Mbaud (changing to 500Kbit/s in mot 90J)
(optional) M-Link * RS485 to C5 * CAN to EICS/C5 (Remote EDIS only)

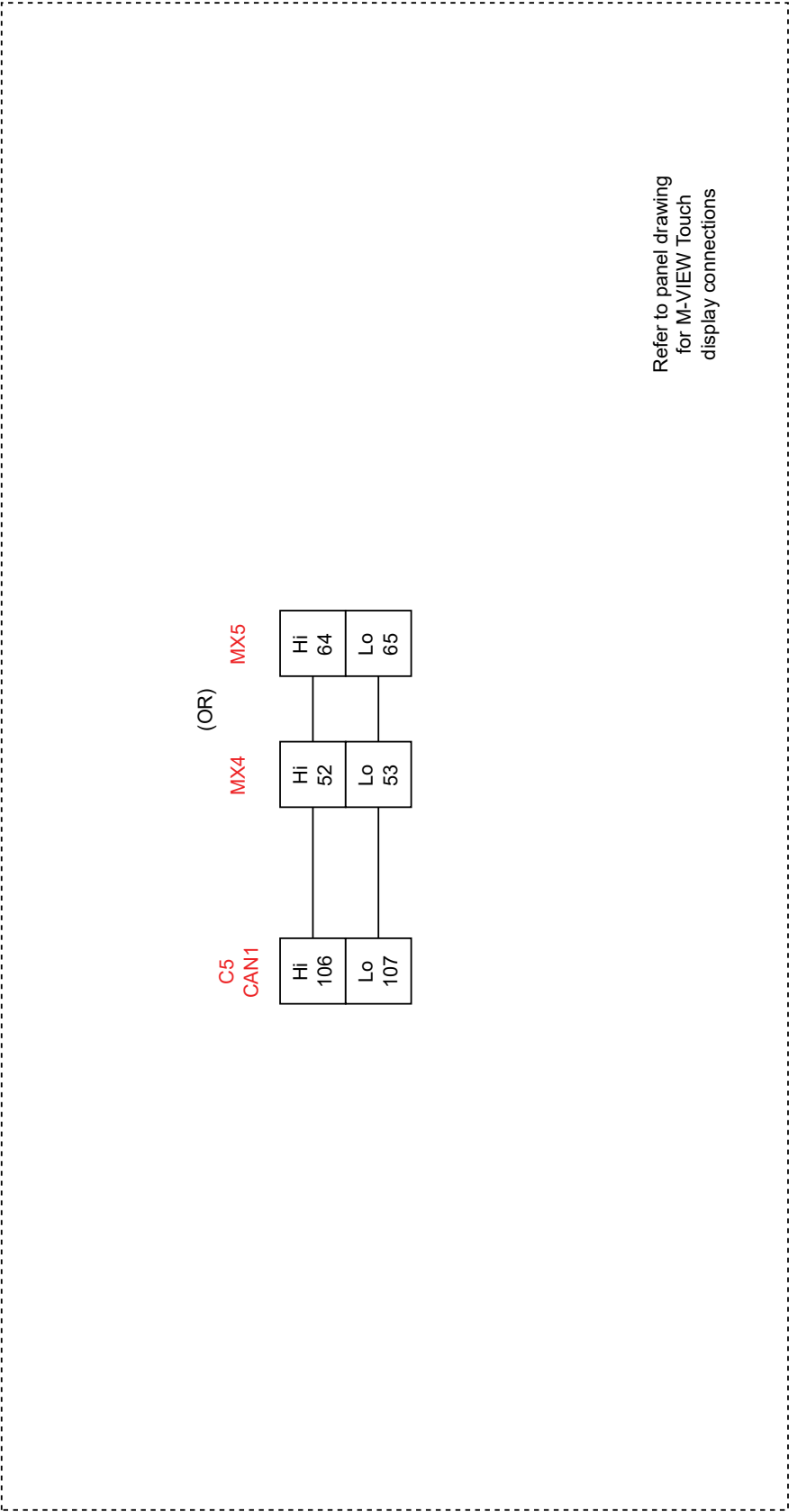


Common Bus

C5 Control Panel, No M-Link, No EICS

SR1.0 C5 * Common Bus * CAN1 500Kbit/s

Panel

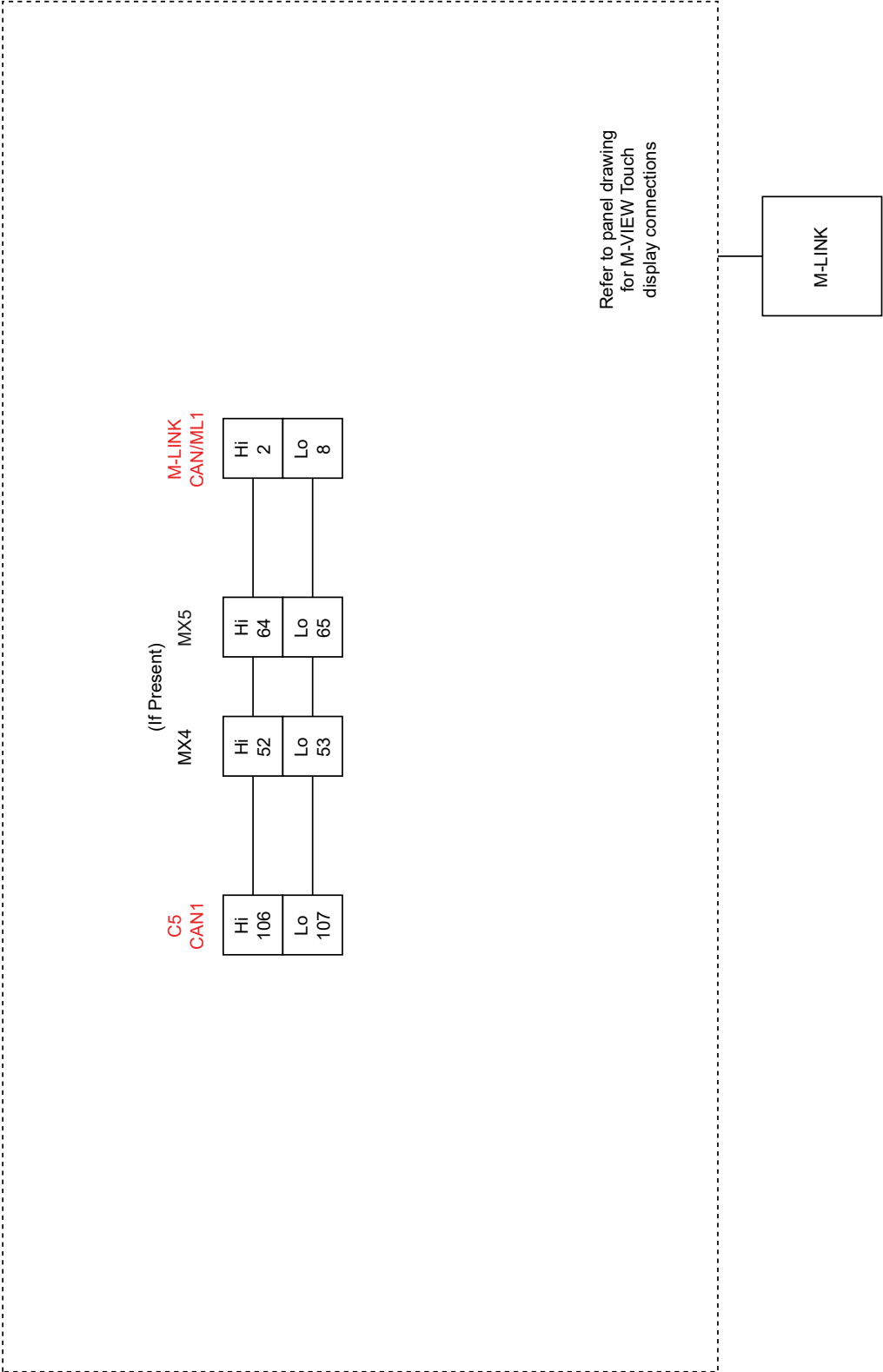


Model	Firmware
C5	50-33-3921

C5 Control Panel with M-Link (No EICS)

SR1.0 C5 * Common Bus * CAN1 500Kbit/s
M-Link * CAN to C5

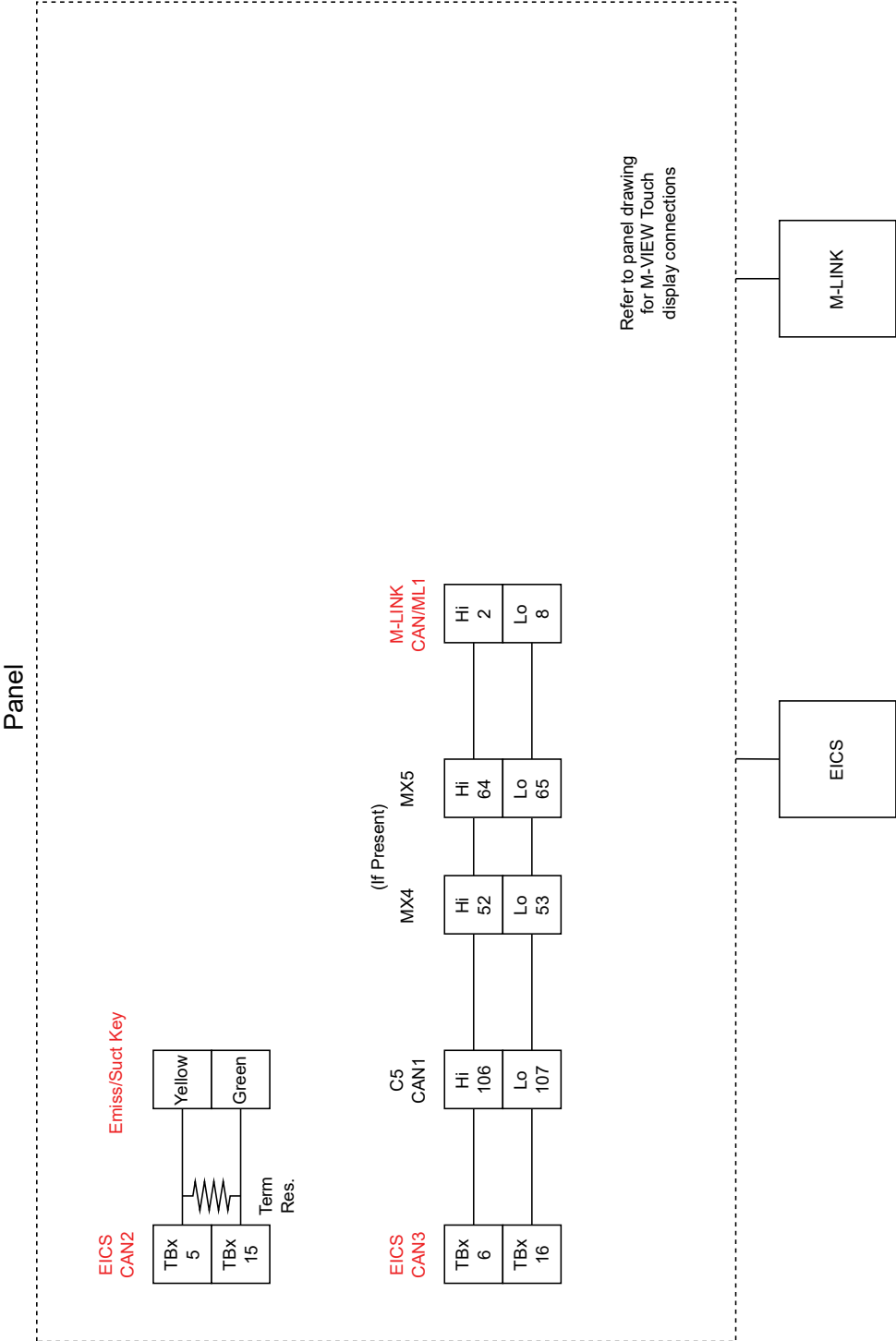
Panel



Model	Firmware
C5	50-33-3921
M-Link	>= 5.1.10948

C5 Control Panel with M-Link and Single Bank EICS Engine

SR1.0 C5 * Common Bus * CAN1 500Kbit/s
EICS (Single) * CAN2 250Kbit/s * CAN3 500Kbit/s
M-Link * CAN to EICS/C5

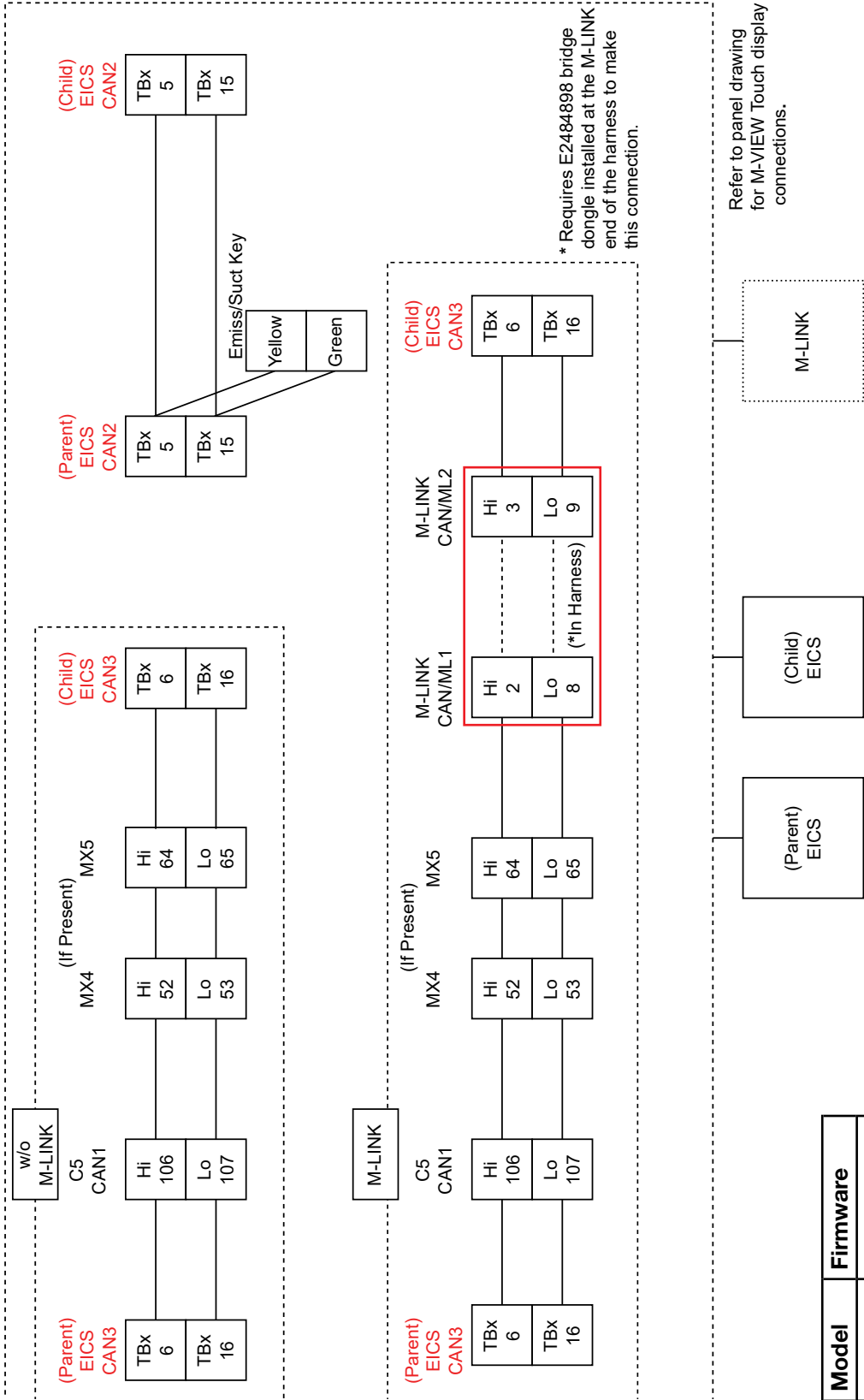


Model	Firmware
C5	50-33-3921
EICS	>= 90J
M-Link	>= 5.1.10948

C5 Control Panel with M-Link and Dual Bank EICS Engine

SR1.0 C5 * Common Bus * CAN1 500Kbit/s
EICS (Parent/Child) * CAN2 250Kbit/s * CAN3 500Kbit/s
(Optional) M-Link * CAN to EICS/C5

Panel



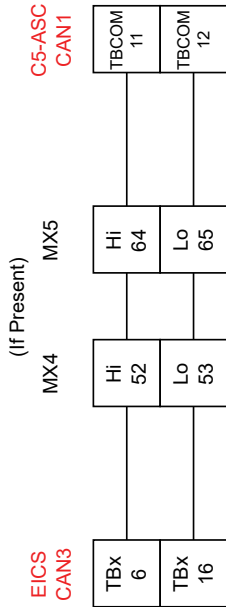
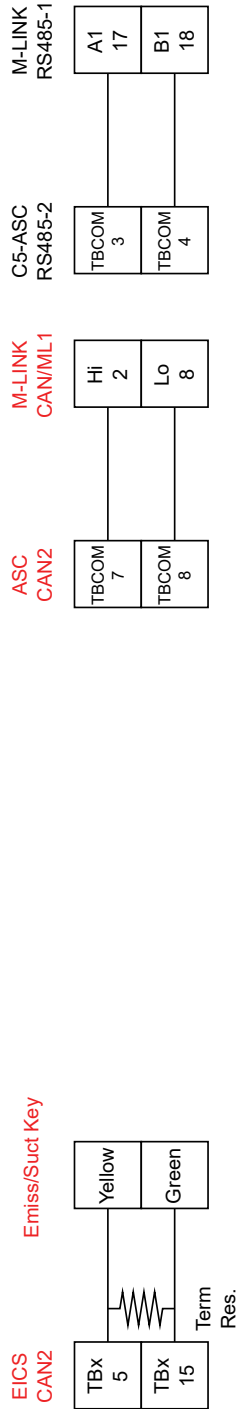
Model	Firmware
C5	50-33-3921
EICS	>= 90J
M-Link	>= 5.1.10948

Standard Bus

C5-ASC E2469600 Control Panel with Single Bank EICS Engine

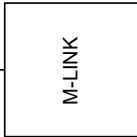
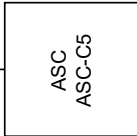
E2469600 (A-28180) ASC Main Module (blue base) * ASC CAN2 1Mbit/s * C5 CAN1 1Mbit/s
EICS (Single) * CAN2 250Kbit/s * CAN3 1Mbit/s
M-Link * CAN to ASC * RS485 to ASC-C5

Panel



Refer to panel drawing
for M-VIEW Touch
display connections

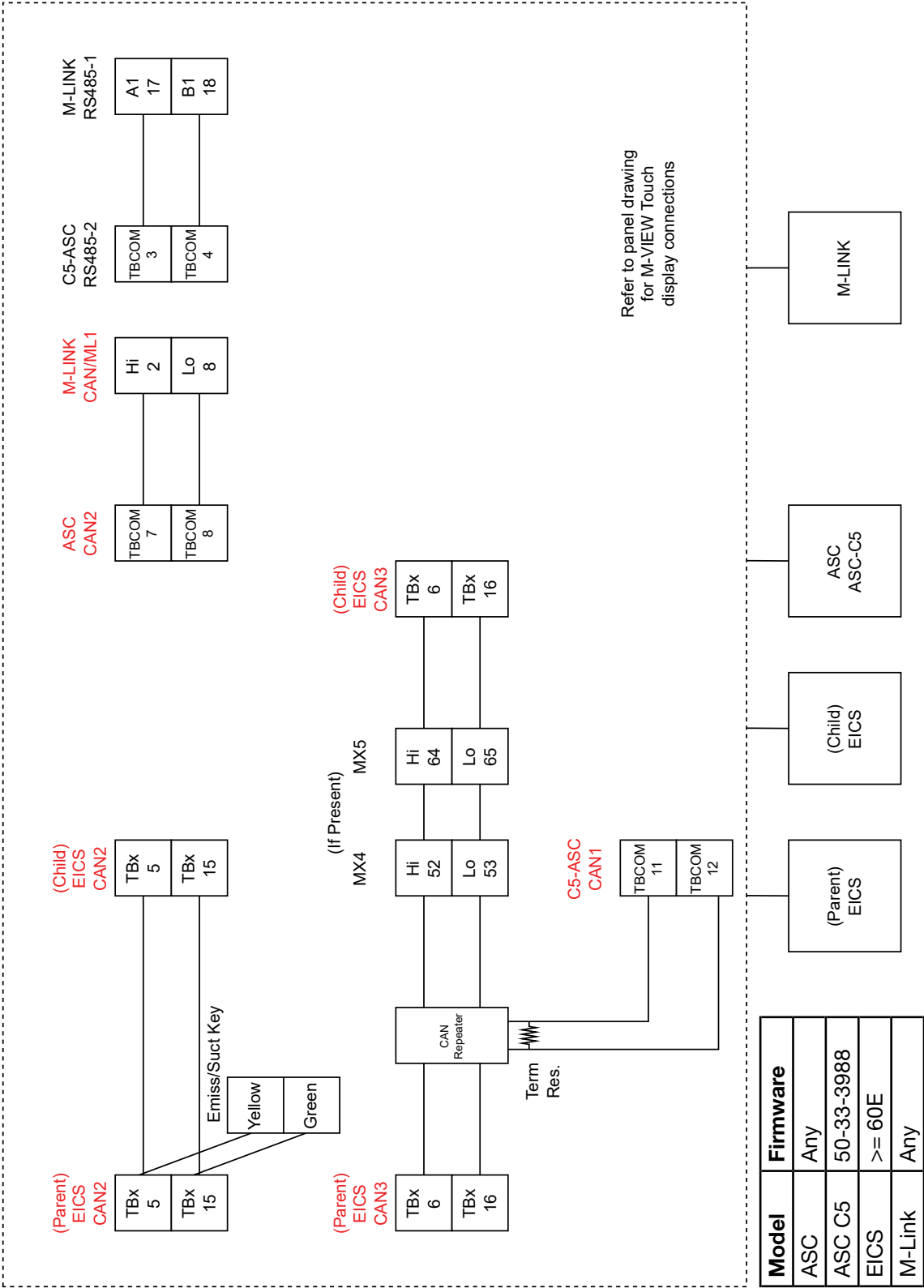
Model	Firmware
ASC	Any
ASC C5	50-33-3988
EICS	>= 60E
M-Link	Any



C5-ASC E2469600 Control Panel with Dual Bank EICS Engine

E2469600 (A-28180) ASC Main Module (blue base) * ASC CAN2 1Mbit/s * C5 CAN1 1Mbit/s
EICS (Parent/Child) * CAN2 250Kbit/s * CAN3 1Mbit/s
M-Link * CAN to ASC * RS485 to ASC-C5

There are no systems in this configuration at this time. Panel

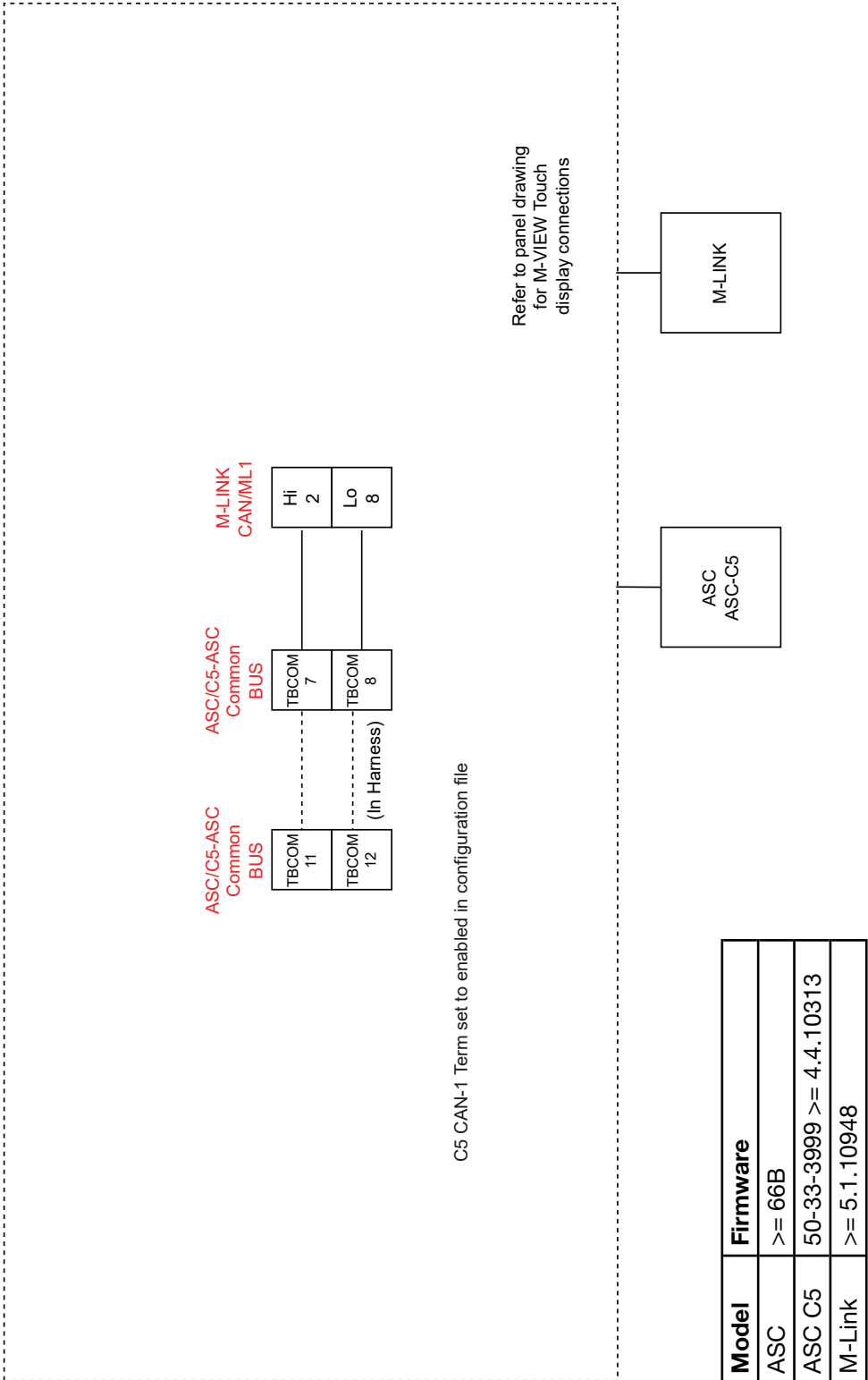


Common Bus

C5-ASC E2469620 Control Panel with M-Link (No Expansion, No EICS)

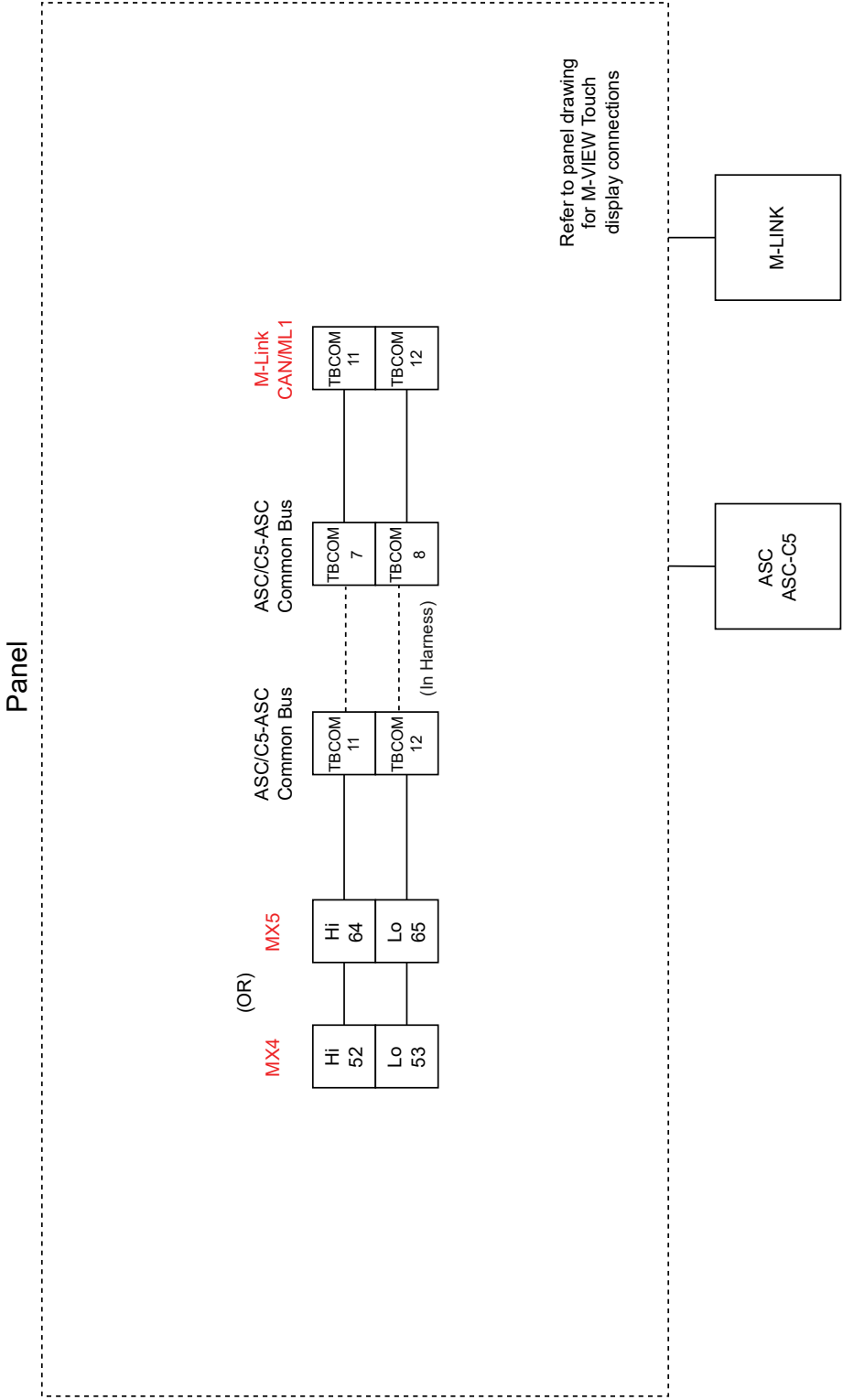
E2469620 (A-28692) ASC Main Module (black base) * Common Bus * ASC CAN2 500Kbit/s * ASC-C5 CAN1 500Kbit/s M-Link * CAN to ASC/ASC-C5

Panel



C5-ASC E2469620 Control Panel with M-Link and Expansion (No EICS)

E2469620 (A-28692) ASC Main Module (black base) * Common Bus * ASC CAN2 500Kbit/s * ASC-C5 CAN1 500Kbit/s
M-Link * CAN to ASC/ASC-C5

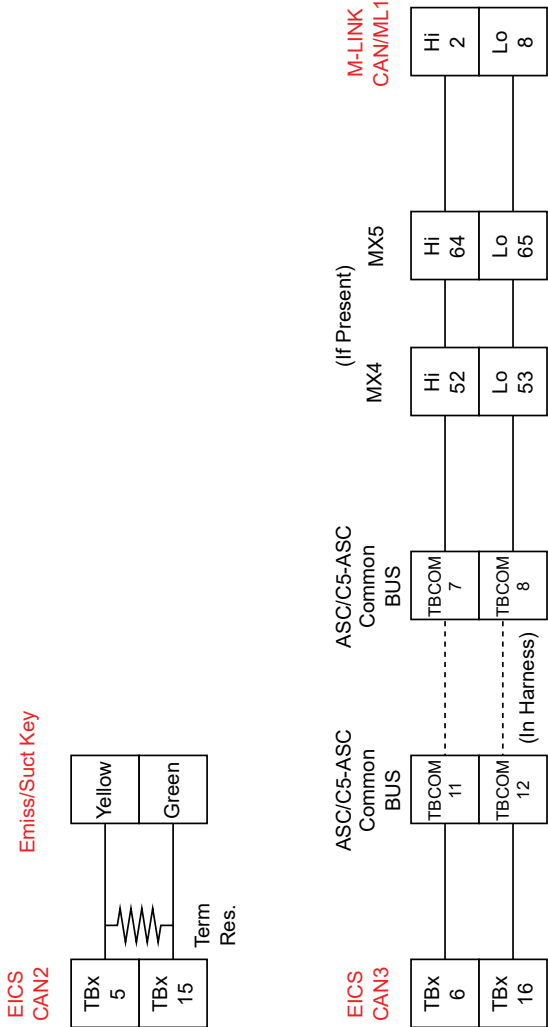


Model	Firmware
ASC	>= 66B
ASC C5	50-33-3999 >= 4.4.10313
M-Link	>= 5.1.10948

C5-ASC E2469620 Control Panel with Single Bank EICS Engine

E2469620 (A-28692) ASC Main Module (black base) * Common Bus * ASC CAN2 500Kbit/s * ASC-C5 CAN1 500Kbit/s
EICS (Single) * CAN2 250Kbit/s * CAN3 500Kbit/s
M-Link * CAN to ASC/ASC-C5

Panel



Refer to panel drawing
for M-VIEW Touch
display connections

Model	Firmware
ASC	>= 66B
ASC C5	50-33-3999 >= 4.4.10313
EICS	>= 90J
M-Link	>= 5.1.10948

EICS

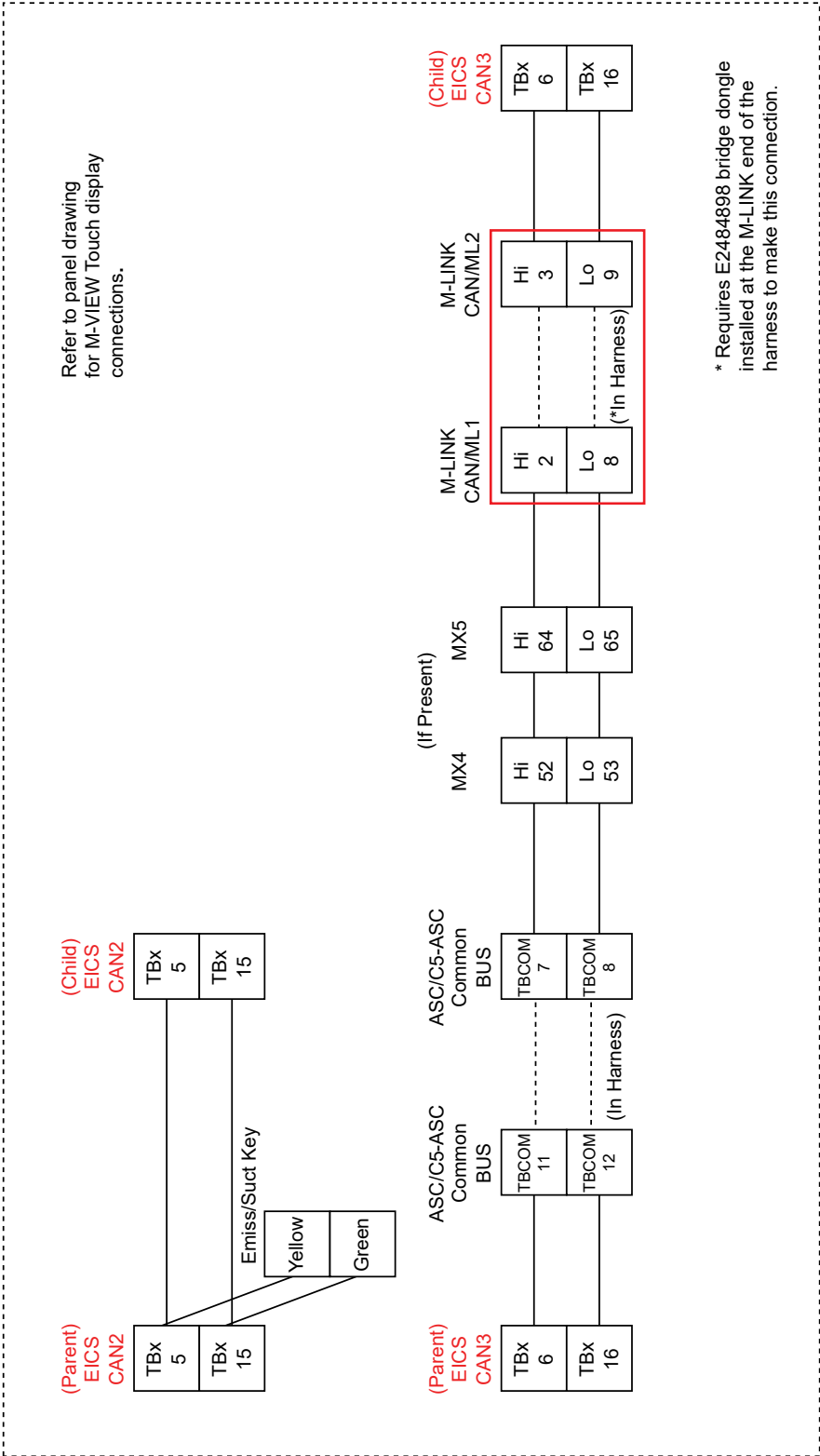
ASC
ASC-C5

M-LINK

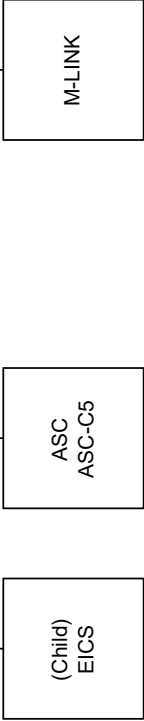
C5-ASC E2469620 Control Panel with Dual Bank EICS Engine

E2469620 (A-28692) ASC Main Module (black base) * Common Bus * ASC CAN2 500Kbit/s * ASC-C5 CAN1 500Kbit/s
EICS (Parent/Child) * CAN2 250Kbit/s * CAN3 500Kbit/s
M-Link * CAN to ASC/ASC-C5

Panel



Model	Firmware
ASC	>= 66B
ASC C5	50-33-3999 >= 4.4.10313
EICS	>= 90J
M-Link	>= 5.1.10948



Harness Cross Reference

Harness Cross Reference for ASC-E2469600, rev 1-5-2021

Panel		Device		
TB	H CON	J5	Schematic Name	Connection In 3rd Party Panel
TBDI-1	H1-1	J5-1	DI1	
TBDI-2	H1-2	J5-2	B+1	
TBDI-3	H1-3	J5-3	DI2	
TBCOM-11	H1-4	J5-5	CAN1_ST_P	To EICS, MX Modules
TBAO-1	H1-5	J5-6	4-20mA_OUT1+	
TBDI-5	H1-6	J5-7	DI3	
TBDI-10	H1-7	J5-8	B+2	
TBDI-7	H1-8	J5-9	DI4	
TBAI-2	H1-9	J5-41	AB+	
TBDO-1	H1-10	J5-43	HSO1	
TBDO-2	H1-11	J5-44	HSO2	
TBDO-3	H1-12	J5-45	HSO3	
TBDO-4	H1-13	J5-46	HSO4	
TBDO-5	H1-14	J5-47	HSO5	
TBCOM-7	H1-15	J5-10	WD_CAN2_P	To M-Link Pin 2
TBDI-9	H1-16	J5-11	DI5	
TBDI-18	H1-17	J5-12	B+3	
TBDI-11	H1-18	J5-13	DI6	
TBCOM-12	H1-19	J5-15	CAN1_ST_N	To EICS, MX Modules
TBRTD-1	H1-20	J5-16	RTD1+	
TBDI-13	H1-21	J5-17	DI7	
TBDI-26	H1-22	J5-18	B+4	
TBDO-6	H1-23	J5-48	HSO6	
TBDO-7	H1-24	J5-49	HSO7	
TBDO-8	H1-25	J5-50	HSO8	
TBPWR-4	H1-26	J5-51	Ground	
TBPWR-5	H1-27	J5-52	Ground	
TBPWR-6	H1-28	J5-53	Ground	
TBDI-15	H1-29	J5-19	DI8	
TBCOM-8	H1-30	J5-20	WD_CAN2_N	To M-Link Pin 8
TBAI-1	H1-31	J5-21	AI1	
TBDI-17	H1-32	J5-22	DI9	
TBDI-25	H1-33	J5-23	DI13	
TBDI-19	H1-34	J5-24	DI10	
TBDI-27	H1-35	J5-25	DI14	

Harness Cross Reference for ASC-E2469600, rev 1-5-2021 (continued)

Panel		Device		
TB	H CON	J5	Schematic Name	Connection In 3rd Party Panel
TBAO-4	H1-36	J5-26	4-20mA_OUT2+	
TBPWR-1	H1-37	J5-56	Vbat	
TBPWR-2	H1-38	J5-57	Vbat	
TBPWR-3	H1-39	J5-58	Vbat	
TBDO-10	H1-40	J5-59	ASC_DO_alarm	
TBDO-11	H1-41	J5-60	ASC_DO_shutdown	
	H1-42			
TBDI-21	H1-43	J5-27	DI11	
TBDI-29	H1-44	J5-28	DI15	
TBDI-23	H1-45	J5-29	DI12	
TBDI-31	H1-46	J5-30	DI16	
TBCOM-1	H1-47	J5-31	RS485A+	
TBCOM-2	H1-48	J5-32	RS485A-	
	H1-49			
TBCOM-3	H1-50	J5-33	RS485B+	(Optional) to M-Link Pin 17
TBCOM-4	H1-51	J5-34	RS485B-	(Optional) to M-Link Pin 18
	H1-52			
	H1-53			
	H1-54			
	H1-55			
	H1-56			
TBAI-4	H1-57	J5-35	AI2	
TBRD-2	H1-58	J5-36	RTD1a-	
TBRD-3	H1-59	J5-37	RTD1b-	
TBRD-4	H1-60	J5-38	RTD2+	
TBRD-5	H1-61	J5-39	RTD2+	
TBRD-6	H1-62	J5-40	RTD2-	
TBDO-9	H1-63	J5-42	ASC_DI_reset	
TBCOM-5	H1-64	J5-54	WD_CAN1_P	to ASC Display Pin 2
TBCOM-6	H1-65	J5-55	WD_CAN2_P	to ASC Display Pin 1
TBCOM-9	H1-66	J5-4	CAN2_ST_P	Future Use
TBCOM-10	H1-67	J5-14	CAN2_ST_N	Future Use
	H1-68			
	H1-69			
	H1-70			

Harness Cross Reference for ASC-E2469620, rev 1-5-2021

Panel		Device		
TB	H CON	J5	Schematic Name	Connection In 3rd Party Panel
TBDI-1	H1-1	J5-1	DI1	
TBDI-2	H1-2	J5-2	B+1	
TBDI-3	H1-3	J5-3	DI2	
TBCOM-11	H1-4	J5-5	CAN1_ST_P	Common Bus
TBAO-1	H1-5	J5-6	4-20mA_OUT1+	
TBDI-5	H1-6	J5-7	DI3	
TBDI-10	H1-7	J5-8	B+2	
TBDI-7	H1-8	J5-9	DI4	
TBAI-2	H1-9	J5-41	AB+	
TBDO-1	H1-10	J5-43	HSO1	
TBDO-2	H1-11	J5-44	HSO2	
TBDO-3	H1-12	J5-45	HSO3	
TBDO-4	H1-13	J5-46	HSO4	
TBDO-5	H1-14	J5-47	HSO5	
TBCOM-7	H1-15	J5-10	WD_CAN2_P	Common Bus
TBDI-9	H1-16	J5-11	DI5	
TBDI-18	H1-17	J5-12	B+3	
TBDI-11	H1-18	J5-13	DI6	
TBCOM-12	H1-19	J5-15	CAN1_ST_N	Common Bus
TBRTD-1	H1-20	J5-16	RTD1+	
TBDI-13	H1-21	J5-17	DI7	
TBDI-26	H1-22	J5-18	B+4	
TBDO-6	H1-23	J5-48	HSO6	
TBDO-7	H1-24	J5-49	HSO7	
TBDO-8	H1-25	J5-50	HSO8	
TBPWR-4	H1-26	J5-51	Ground	
TBPWR-5	H1-27	J5-52	Ground	
TBPWR-6	H1-28	J5-53	Ground	
TBDI-15	H1-29	J5-19	DI8	
TBCOM-8	H1-30	J5-20	WD_CAN2_N	Common Bus
TBAI-1	H1-31	J5-21	AI1	
TBDI-17	H1-32	J5-22	DI9	
TBDI-25	H1-33	J5-23	DI13	
TBDI-19	H1-34	J5-24	DI10	
TBDI-27	H1-35	J5-25	DI14	

Harness Cross Reference for ASC-E2469620, rev 1-5-2021 (continued)

Panel		Device		
TB	H CON	J5	Schematic Name	Connection In 3rd Party Panel
TBAO-4	H1-36	J5-26	4-20mA_OUT2+	
TBPWR-1	H1-37	J5-56	Vbat	
TBPWR-2	H1-38	J5-57	Vbat	
TBPWR-3	H1-39	J5-58	Vbat	
TBDO-10	H1-40	J5-59	ASC_DO_alarm	
TBDO-11	H1-41	J5-60	ASC_DO_shutdown	
	H1-42			
TBDI-21	H1-43	J5-27	DI11	
TBDI-29	H1-44	J5-28	DI15	
TBDI-23	H1-45	J5-29	DI12	
TBDI-31	H1-46	J5-30	DI16	
TBCOM-1	H1-47	J5-31	RS485A+	
TBCOM-2	H1-48	J5-32	RS485A-	
	H1-49			
TBCOM-3	H1-50	J5-33	RS485B+	(Optional) to M-Link Pin 17
TBCOM-4	H1-51	J5-34	RS485B-	(Optional) to M-Link Pin 18
	H1-52			
	H1-53			
	H1-54			
	H1-55			
	H1-56			
TBAI-4	H1-57	J5-35	AI2	
TBRTD-2	H1-58	J5-36	RTD1a-	
TBRTD-3	H1-59	J5-37	RTD1b-	
TBRTD-4	H1-60	J5-38	RTD2+	
TBRTD-5	H1-61	J5-39	RTD2+	
TBRTD-6	H1-62	J5-40	RTD2-	
TBDO-9	H1-63	J5-42	ASC_DI_reset	
TBCOM-5	H1-64	J5-54	WD_CAN1_P	To ASC Display Pin 2
TBCOM-6	H1-65	J5-55	WD_CAN2_P	To ASC Display Pin 1
TBCOM-9	H1-66	J5-4	CAN2_ST_P	Factory Use (C5 Bootloader)
TBCOM-10	H1-67	J5-14	CAN2_ST_N	Factory Use (C5 Bootloader)
	H1-68			
	H1-69			
	H1-70			

Panel		Device		
TB	H CON	J1	Schematic Name	Connection In 3 rd Party Panel
TB	1	J1-1	Ground	Panel Shutdown Relay-Coil (-)
TB	1	J1-1	Ground	Fuel Valves (-)
TB	1	J1-1	Ground	Starter Relay-Coil(-)
TB	2	J1-2	Ground	Battery (-)
TB	2	J1-2	Ground	PV450 Port B-6
TB	3	J1-3	RS485-	
TB	4	J1-4	RS485+	
TB	5	J1-5	CAN2+	Emissions and/or Suction Key (CAN High) Yellow
TB	5	J1-5	CAN2+	CAN 2 (High) PB450 Port B-2
TB	6	J1-6	CAN3+	CAN 3 (High) Common Bus to M-Link, C5
TB	7	J1-7	RTD4+	
TB	8	J1-8	Recirc Valve +/-4-20mA_Out+	RPM AUX Output 4-20mA (+) [PIC 18]
TB	9	J1-9	VBAT	Battery (+)
TB	10	J1-10	VBAT	Battery (+)
TB	11	J1-11	Ground	Emissions and/or Suction Key Black (DC-)
TB	11	J1-11	Ground	Battery (-)
TB	12	J1-12	Ground	Battery (-)
TB	13	J1-13	RTD3+	
TB	14	J1-14	RTD3-	
TB	15	J1-15	CAN2-	Emissions and/or Suction Key (Can Low) Green
TB	15	J1-15	CAN2-	CAN 2 (Low) PB450 Port B-3
TB	16	J1-16	CAN3-	CAN 3 (Low) Common Bus to M-Link, C5
TB	17	J1-17	RTD4-	
TB	18	J1-18	Recirc Valve -/4-20mA_Out-	RPM AUX Output 4-20mA (-) [PIC 8]
TB	19	J1-19	VBAT	Battery (+)
TB	20	J1-20	VBAT	Battery (+)
TB	21	J1-21	Crank Request/Aux_ana_PUD7/ DIG7	Push to Start Button-N.O.
TB	22	J1-22	Increase Rpm/Aux_ana_PUD8/ DIG8	Manual Speed Control-Common
TB	23	J1-23	Proportional RPM Target SEL/ AUX_ana_PUD9/DIG9	Manual/Automatic Speed Select (+)
TB	24	J1-24	4-20mA_gnd_D	
TB	25	J1-25	4-20mA_sig_D	

Harness Cross Reference for EICS, rev 1-5-2021 (continued)

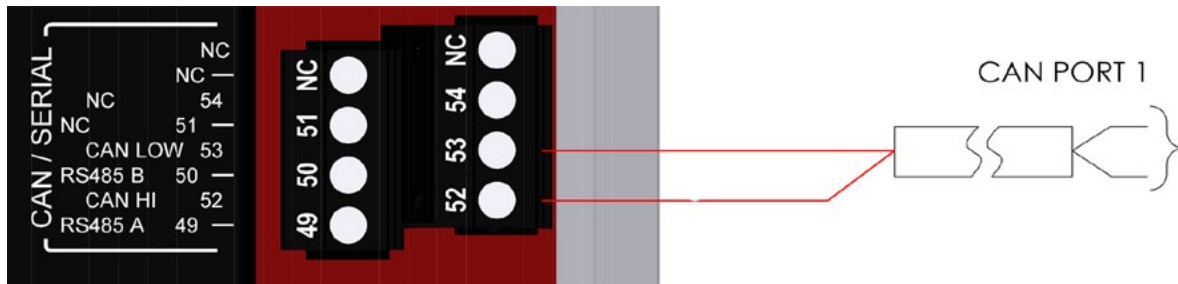
Panel		Device		
TB	H CON	J1	Schematic Name	Connection In 3 rd Party Panel
TB	26	J1-26	OPTO2_Sw+	LPG Fuel Switch-Close for LPG [PIC 37]
TB	27	J1-27	OPTO1_Sw+	AUX Engine End Device-Close to Shutdown [PIC 38]
TB	28	J1-28	ESD_Sw+	Emergency Shutdown (ESD)-Close to Stop-N.O.
TB	29	J1-29	IGN_DIS_Sw-	Engine Run/Stop-Close to Stop-N.C.
TB	30	J1-30	IGN_DIS_Sw+	Engine Run/Stop-Close to Stop-Common
TB	31	J1-31	Crank Request Return/PUD7_rtn	
TB	32	J1-32	PUD8_rtn	Manual Speed Control-Decrease
TB	33	J1-33	Select Manual RPM Target/ PUD9_rtn	Manual/Automatic Speed Select (rta)
TB	34	J1-34	Suction Pressure Ground/4- 20mA_gnd_C	
TB	35	J1-35	Suction Pressure Signal/4- 20mA_sig_C	Suction Pressure Sensor-PXT-L Black Wire
TB	36	J1-36	VBAT Protect/AUX_PWM5_HS	Suction Pressure Sensor-PXT-K Red Wire
TB	36	J1-36	VBAT Protect/AUX_PWM5_HS	PV450 Port B-1 & B-5
TB	36	J1-36	VBAT Protect/AUX_PWM5_HS	Emissions & Suction Key Red
TB	37	J1-37	OPTO2_Sw-	Lpg Fuel Switch-Close for LPG [PIC 26]
TB	38	J1-38	OPTO1_Sw-	AUX Engine End Device-Close to Shutdown [PIC 27]
TB	39	J1-39	ESD_Sw-	Emergency Shutdown (Esd)-Close to Stop-Com
TB	40	J1-40	Starter_HS	Starter Relay-Coil (+)
TB	41	J1-41	PUD7_5V	Push to Start Button-Common
TB	42	J1-42	Decrease RPM/PUD8_5V	Manual Speed Control-Increase
TB	43	J1-43	Suction Pressure Based RPM SEL/PUD9_5V	
TB	44	J1-44	4-20mA_gnd_A	Remote Speed Input 4-20mA Ground (-)
TB	45	J1-45	Proportional Speed Input/4- 20mA_sig_A	Remote Speed Input 4-20mA Signal (+)
TB	46	J1-46	AUX_PWM3_HS	Panel Shutdown Relay-Coil (+)
TB	47	J1-47	AUX_PWM4_HS	LPG Gas Fuel Shutoff Valve (+) Dual Fuel App Only
TB	48	J1-48	Warning_HS	
TB	49	J1-49	MIL_HS	
TB	50	J1-50	Lockoff_HS	Natural Gas Fuel Shutoff Valve (+)

CAN Port - MX4-R2 and MX5-R2

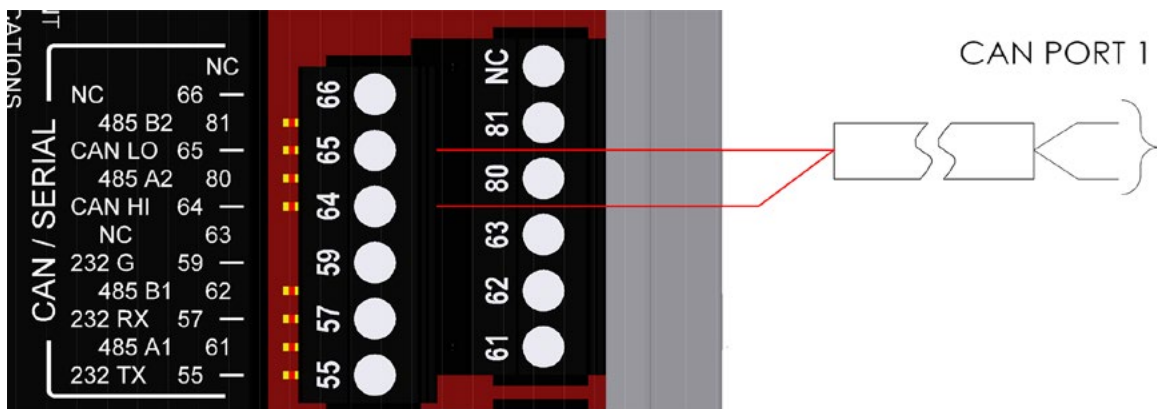
Our MX I/O modules are equipped with a CAN communication port.

NOTE: These circuits are not required to be in conduit if all the requirements for ic protection are met and Authority Having Jurisdiction (AHJ) allows.

The MX4-R2 port is marked pin 52 CAN HI and pin 53 CAN LOW.

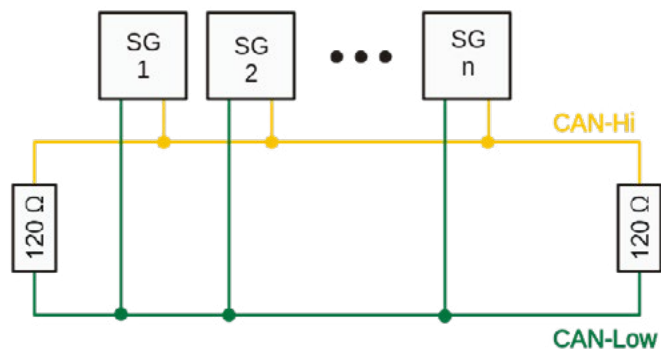


The MX5-R2 port is marked pin 64 CAN HI and pin 65 CAN LOW.



The LED lights when the port is active transmitting and when the port is active receiving.

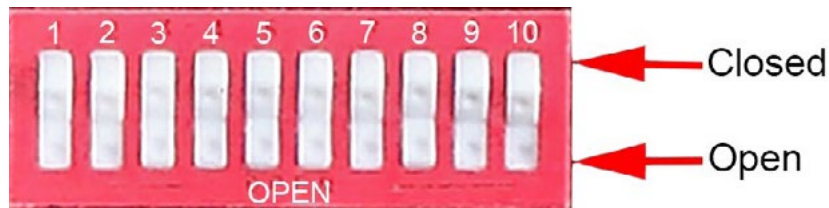
The recommended arrangement of the wires is as a connected series of point-to-point (multidropped) nodes, i.e. a line or bus, not a star, ring or multiply connected network. We recommend using CAN-Bus Cable J1939/11 SAE Shielded, twisted pair with 120 Ω characteristic impedance. Install a 120 Ω terminating resistor (DIP switch controls this on the MX4-R2) on the physical first and last node of the CAN network. All nodes must share a common DC ground.



Important: For Entity Parameters or Power Supply and Grounding, refer to Wire Connections.

DIP Switch Configuration - MX4-R2 and MX5-R2

Set these switches to the open or closed position for your application.



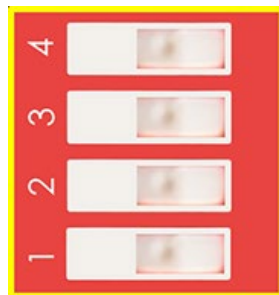
Node Address:

- **DIP1-8:** These switches allow you to assign a unique address to each MX module that may be in the system using either Modbus or CAN communication. This allows the client controller to differentiate between the modules. Addressing is done in binary format, with each switch increasing value by factor of 2. For example, to name the controller address 5, set switch DIP1 and DIP4 to the CLOSED position. Valid settings are from 1 to 239. Addresses 240 thru 255 are for power-up functions only as detailed below.
- **DIP Power-up Functions:** There is a special feature for switching module operation mode that is activated by setting specific switch positions at power up. Change will only occur if the following switches are set CLOSED at power up. All other times, these switches behave as address selections.
 - DIP switches 5-8 CLOSED at power up activates special mode to change the module behavior based on switches 1-4 position.



5-8 Closed

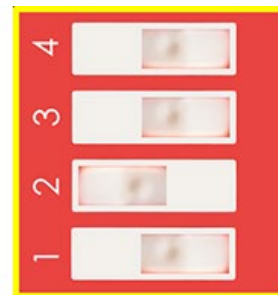
- 1-4 CLOSED: Load factory defaults to non-volatile settings – restores serial baud rate, Ethernet address and channel configurations to default values.
- 1 OPEN, 2-4 CLOSED: Load Rockwell IO Application.
- 2 OPEN, 1, 3, 4 CLOSED: Load Standard IO Application.



1-4 Closed



1 Open, 2-4 Closed



2 Open, 1, 3, 4 Closed

- **Stop Bits:** For addresses < 31, the RS485 port will use 1 stop bit. For addresses > 31, the RS485 port will use 2 stop bits.

CAN Termination:

- DIP9: This switch provides a 120Ω termination resistor for the CAN communication chain. CAN must be wired in a daisy chain configuration. Set this switch to CLOSED only when the module is the end of the network. See control panel drawings for designation.

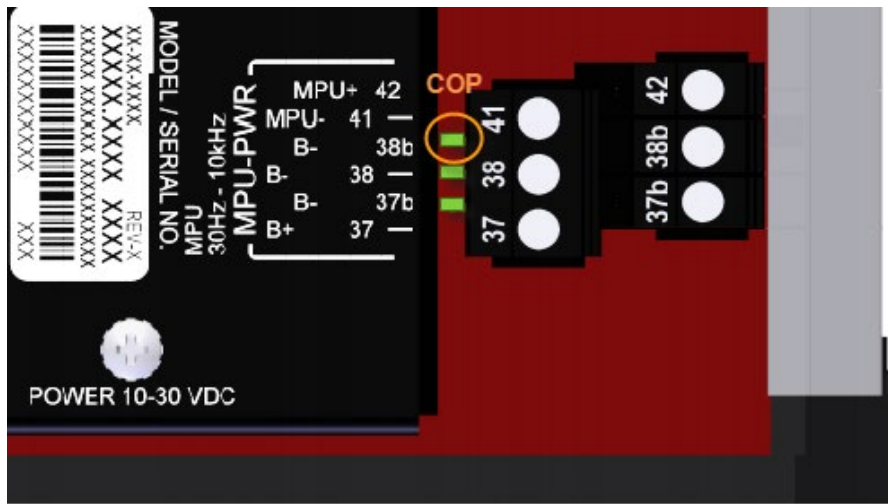
RS485 Termination:

- DIP10: This switch provides a 120Ω termination resistor for the RS485 communication chain. RS485 must be wired in a daisy chain configuration. Set this switch to CLOSED only when the module is the end of the network. See control panel drawings for designation.

Controller Operating Properly (COP) LED Codes

Blink codes will be 2 digits separated by pauses with each blink code further separated by a rapid blink event.

- Blink codes will be ¼ second ON and ¼ second OFF.
- Pauses will be ¾ second OFF.
- The separator will be a 2 1/2 seconds pause.



Blink Codes *	Code Description
1, 1	Startup Error
4, 1	Rockwell Automation IO Application Mode
4, 2	Standard IO Application Mode
4, 3	Custom Application Mode
* There will be a ¾ second pause between the digits.	

NOTE: A fast flash (100ms on/off) = Running in bootloader mode. Bootloader is the mode used for switching applications or module reprogramming via external CAN tools.

Communications for Rockwell Automation IO Mode (optional)

Physical Layer: The MX module features two Ethernet ports.

Ethernet Interconnect: Two RJ45 jacks. This connection may require setting the IP address of the module to the desired network configuration. Ethernet port settings can be changed by modifying Modbus registers. Default setting is 192.168.0.100 IP, 255.255.255.0 network mask, 0.0.0.0 Gateway.

Ethernet Protocol: CIP for use with Rockwell Automation IO.

CAN Ports Screen for M-View 5-C Display

MVIEW CAN PORTS	L1
CAN-1 ADDRESS	◀
CAN-1 ARBITRARY	
CAN-1 TERM RES	
LOST CAN-1 DLY	
CAN-2 ADDRESS	
	3 ▶
CLAIMED	1
◀ ▶	ENTER - EDIT MORE MENUS

CAN bus is used for long distance high speed communication. Distances up to 100 feet are possible depending on data rates, and multiple devices can be on the network.

CAN – 1 Address: Source Address is displayed for the address that was negotiated.

CAN – 1 Arbitrary: Arbitrary Address Capable is yes if other devices support address arbitration.

CAN – 1 Term Res: (set by DIP sw) is enabled. Line termination should be turned on at the ends of the network.

Lost CAN 1 DLY: Lost CAN Communication Delay.

120 ohm twisted shielded pair cable should be used for proper line integrity, wired in a daisy chain fashion. Star networks should be avoided.

Can Port Settings on Can-1 for M-View Touch Displays

CAN bus is used for long distance high speed communication. Distances up to 100 feet are possible depending on data rates, and multiple devices can be on the network.

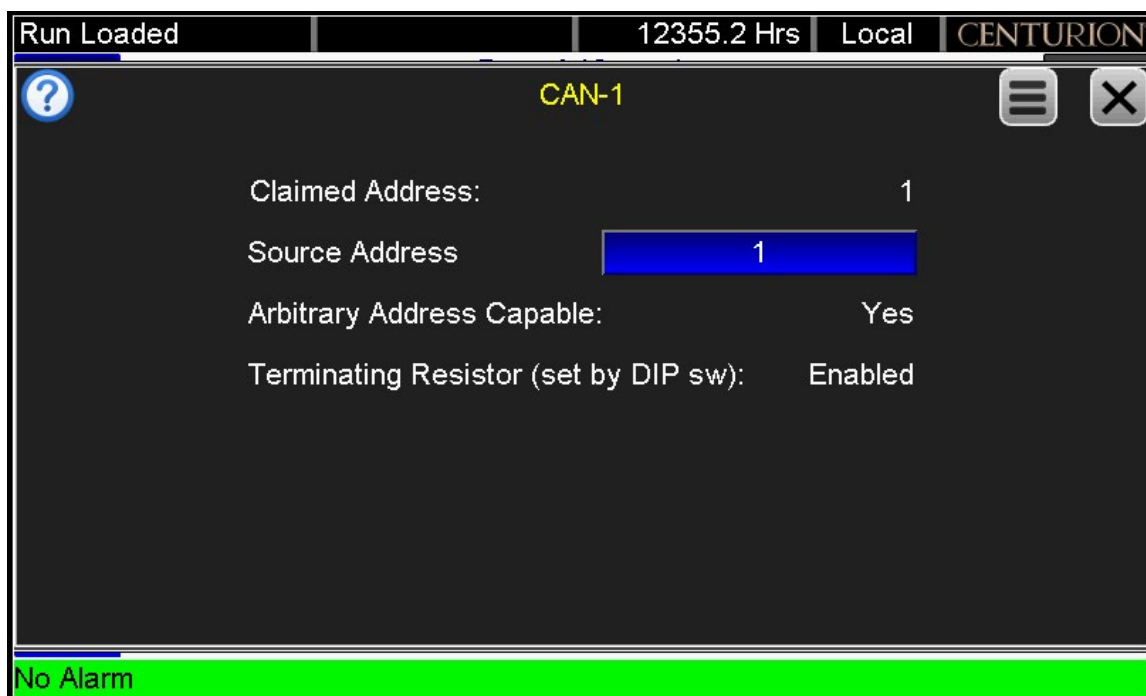
120 ohm twisted shielded pair cable should be used for proper line integrity, wired in a daisy chain fashion. Star networks should be avoided.

Claimed Address is displayed for the address that was negotiated.

Source Address is for the Centurion on the network.

Arbitrary Address Capable is yes if other devices support address arbitration.

Terminating Resistor (set by DIP sw) is enabled. Line termination should be turned on at the ends of the network.



Can Port Settings Can-2 for M-View Touch Displays

CAN bus is used for long distance high speed communication. Distances up to 100 feet are possible depending on data rates, and multiple devices can be on the network.

120 ohm twisted shielded pair cable should be used for proper line integrity, wired in a daisy chain fashion. Star networks should be avoided.

Claimed Address is displayed for the address that was negotiated.

Source Address is for the Centurion on the network.

Arbitrary Address Capable is enable/yes if other devices support address arbitration.

Terminating Resistor (set by DIP sw) is enabled. Line termination should be turned on at the ends of the network.

ECU Address is the engine ECU source address. Some engine ECUs require a specific source address to respond to data request. Refer to engine documentation.

The screenshot shows a software interface for CAN-2 settings. At the top, there's a status bar with 'Run Loaded', '12355.2 Hrs', 'Local', and 'CENTURION'. Below this is a window titled 'CAN-2' with a help icon and a close button. The settings are as follows:

Setting	Value
Claimed Address:	249
Source Address	249
Arbitrary Address Capable	Yes
Terminating Resistor (set by DIP sw):	Enabled
Lost CAN Comm Delay	3 sec
ECU Address	0

At the bottom of the window, a green bar indicates 'No Alarm'.

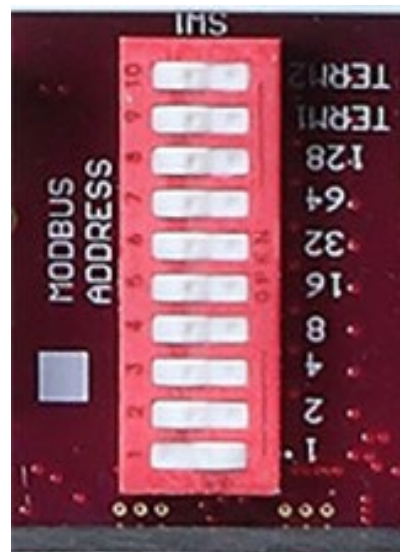
DIP Switch Setting on C5 Controller with M-View Displays

Switch 1-8: Modbus Server Address function for RS485-2 / RS232-2

- Selectable 1-253
- If set to address 0, RS485-2 and RS232-2 ports default to 9600 baud.
- Set to address 1 to connect to the controller if settings are not known. This is the default setting from the factory.

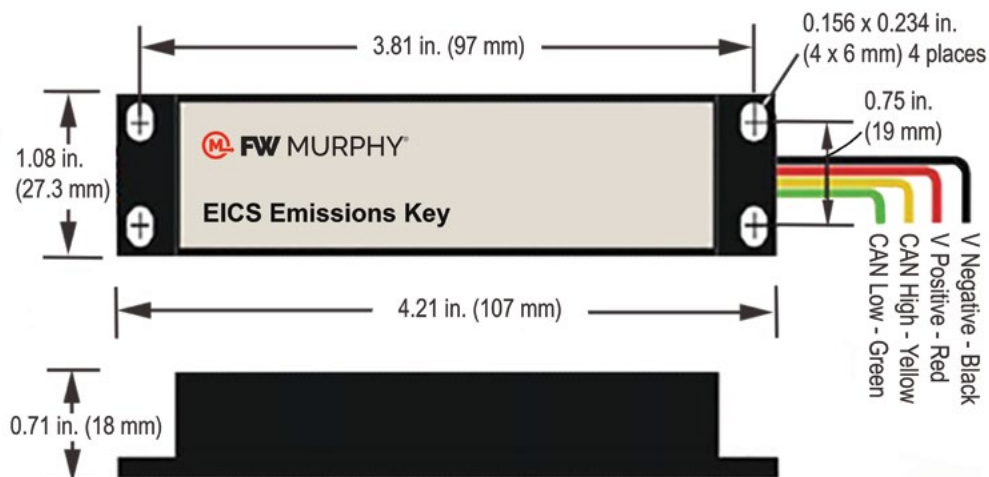
Switch 9: Set to ON to enable CAN1 line termination if C5-1 is at the end of the CAN bus network.

Switch 10: Set to ON to enable CAN2 line termination if C5-1 is at the end of the CAN bus network

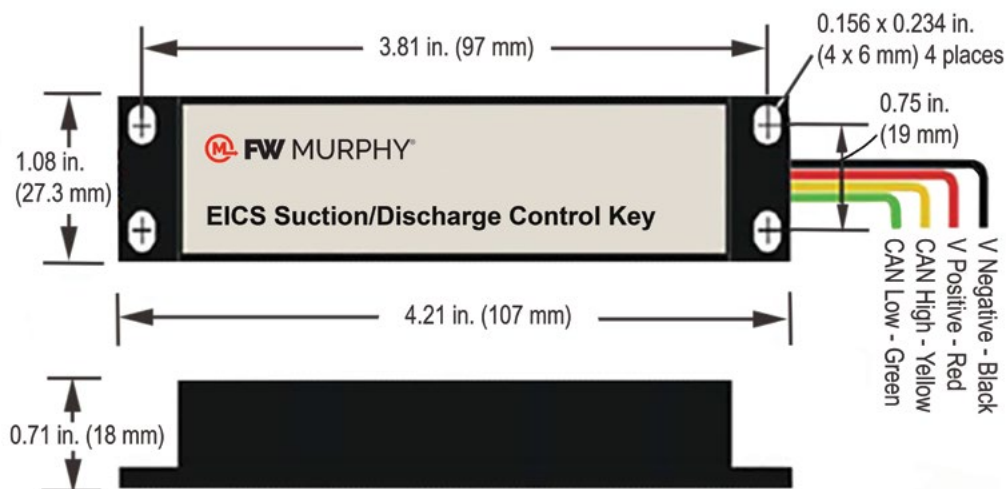


Wiring of Emissions and Suction/Discharge Keys

Installation of the EICS Emission Key enables the operation of the emissions control feature of EICS. After the installation of this key, the post catalyst UEGO sensor and the catalyst temperature monitoring are enabled. The controller moves from a performance operation to an emissions control system. This key is required when the catalyst is installed.



Installation of the EICS Suction/Discharge Control Key allows for automatic speed control of the engine based on changes in suction or discharge pressure. An FW Murphy PXT pressure transducer is also required for the operation of this feature. Check with your local FW Murphy distributor for the correct PXT pressure transducer for your operation.



The EICS Keys are connected to the Panel Interface Connection (PIC) Harness running between the ECM and the Display. PIC wire number labels are shown below:

Wire Color	Description	EICS PIC Harness Wire No.
Black	V (-)	11
Red*	V (+)*	36*
Yellow**	CAN High**	5
Green**	CAN Low**	15

*Call factory if connecting V + (Red) to any connection other than PIC wire No. 36.

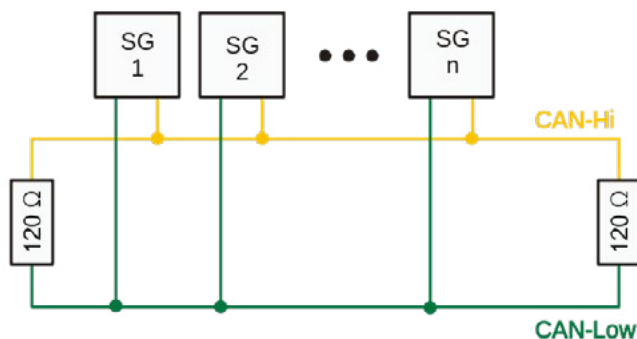
**CAN wires can be trimmed to length but should be twisted together forming a twisted pair of approximately 1 twist per inch before terminating.

NOTE: On some FW Murphy built panels, an intermediate terminal block is used to connect the EICS Keys to the PIC wire numbers listed above.

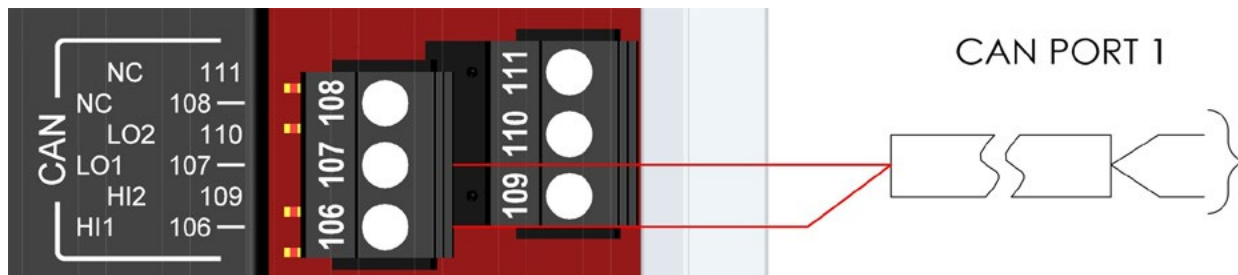
C5 Series CAN (Pins 106 – 111)

The Centurion is equipped with two CAN communications ports. The terminals marked 106 HI1; 107 LO1 and 109 HI2; 110 LO2. There are also two terminals, 108 SHD1 and 111 SHD2 that may be used for shield termination. The LED lights when the port is active transmitting and when the port is active receiving.

The recommended arrangement of the wires is as a connected series of point-to-point (multidropped) nodes, i.e. a line or bus, not a star, ring or multiply connected network. It is recommended to use CAN bus Cable J1939/11 SAE Shielded, twisted pair, with 120 Ω characteristic impedance. Install a 120 Ω terminating resistor (software selectable on the Centurion) on the physical first and last node of the CAN network. All nodes must share a common DC ground.



Important: For Entity Parameters or Power Supply and Grounding, refer to Wire Connections.



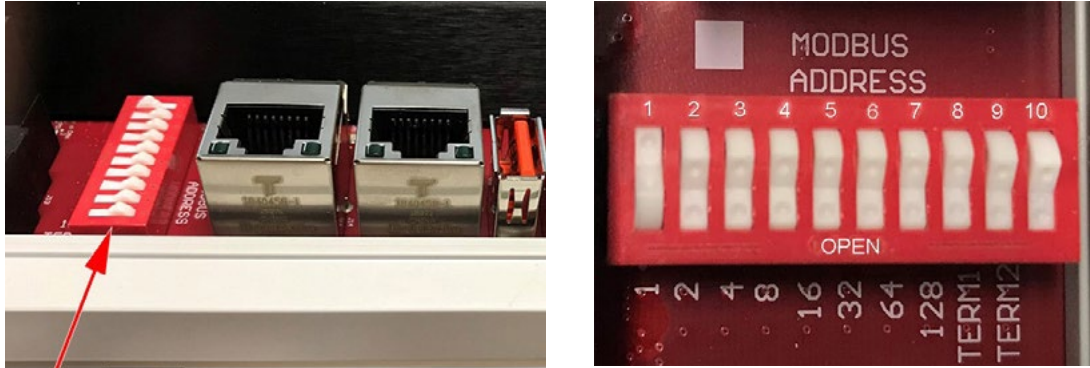
NOTE: These circuits are not required to be in conduit if all the requirements for ic protection are met and Authority Having Jurisdiction (AHJ) allows.

Modbus Address

With the Modbus RTU Server Address Configuration, the operator may assign a unique Modbus address to each controller (server) unit that may be in the system. This allows the client controller to differentiate between the modules.

For example, to name the controller address 21, enable the switches labeled SW1: 1, 4, and 16 ($1 + 4 + 16 = 21$).

NOTE: The subsequent address (Address + 1) is also reserved by Centurion and must not be used by any other device on the Modbus network, or communication failures to devices using that address will occur due to this conflict. Counting by 2's is necessary for additional Centurion controllers present in the system.



NOTE: Typically, this configuration is set to (1) by the factory.

Reference Manuals

Please refer to the following manuals for any additional details.

Reference Manuals for Instructional Details			
Page 31	00-02-0963	C5-1	CAN
Page 13	00-02-1024	MX4-R2	CAN
Page 14	00-02-1024	MX4-R2	DIP Setting
Page 16	00-02-1025	MX5-R2	CAN
Page 17	00-02-1025	MX5-R2	DIP Setting
Page 55	00-02-0912	EICS (3306NA)	CAN
Page 40	00-02-1031	MV-5	CAN
Page 03	00-02-1031	C5-1	DIP Setting
Page 03	00-02-1032	C5-1	DIP Setting
NOTE: Page numbers may change with revision of manuals.			

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