

Replacing an IQ1000II with the Eaton MP-3000

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1. Introduction:

Replacement of the IQ1000II is easy with the MP-3000 Motor Protection Relay. **The MP-3000 Motor Relay comes configured like an IQ1000II.** The panel cutout is identical and the wiring diagram is the same except for the discrete input wiring.

The user interface has been improved to make it easier to navigate through the monitored and logged data. The settings are easily entered through the friendly interface. Settings are grouped into pages Motor, RTD, Trip, Alarm, Start Control, I/O Configuration and System Parameters. The MP-3000 is configured to the IQ1000II default so providing MP-3000 settings is simple and straightforward.

The MP-3000 Motor Protection Relay provides the user with expanded motor applications, configuration flexibility and advanced data logging. The MP-3000 now meets UL 1053 Ground Fault Protection Standard and 30 cycles voltage loss ride through performance. These topics are discussed in more detail in the MP-3000 I.L. 17562.

2. MP-3000 to IQ1000II Comparison

The IQ1000II motor relay is the basis for the MP-3000 Motor Protection Relay. We preserved the field proven motor thermal models and sampling algorithms from the IQ1000II to assure reliable and safe motor operation and protection. This section will provide an overview comparison of the MP-3000 to the IQ1000II. A comparison can be found in Table 1. More detailed comparisons can be found in other sections of this document.

The MP-3000 hardware will appear to be the same as the IQ except for the faceplate. We updated hardware performance with a more powerful micro-controller, added more memory and a clock. The MP-3000 has added surge protection and redesigned power supply to meet UL1053 and voltage ride through capacity.

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We removed the key switch for Run/Program that was on the IQ1000II. The MP-3000 has a latching cover for Program and Emergency Override access. The MP-3000 provides protection functions while in the program mode. New settings will not become active until exiting of the Program mode and returning to the Run mode.

Table 1. MP3000 to IQ1000II Comparison

<u>Protection Functions</u>	<u>Dev. #</u>	<u>MP-3000</u>	<u>IQ1000II</u>	<u>Communications</u>	<u>MP-3000</u>	<u>IQ1000II</u>
Intel-I-Trip™ Overload I2T	49/51	Y	Y	Local HMI	Y	Y
Locked Rotor	49S/51	Y	Y	Help Mode	Y	Y
Jam/Stall	51R	Y	Y	Remote Com. Port	Y	Y
Loss of Load/Underload	37	Y	Y	> INCOM	OPT	OPT
Phase Loss/Unbalance	46	Y	Y	> RS-233	OPT	OPT
Phase Reversal	46	Y	Y	> DeviceNet	OPT	OPT
Phase Inst. OC	50	Y	Y	> Ethernet	OPT	
UL1053 Ground Fault Protection		Y		Addressable	Y	Y
Zero Sequence Ground Fault	50G	Y	Y			
Residual Ground Fault	50N	Y				
Lock out on Thermal Trip I2T	86	Y	Y			
				<u>Construction</u>		
<u>RTD Thermal Protection</u>				Panel Mount Case	Y	Y
RTDs-OptionalURTD Module	38/49	11	11	IQ Cutout	Y	Y
Programmable RTD type		Y (4)	Y (4)	Draw Out	Y(OPT)	Y(OPT)
<u>Start and Control</u>				Power Supply Options		
Reduced Voltage Start		Y	Y	125Vdc	Y(OPT)	Y(OPT)
Number of starts	66	Y	Y	250Vdc	Y(OPT)	Y(OPT)
Starts / time		Y	Y	120Vac	Y	Y
Time Between Starts		Y		230Vac	Y	Y
Number of cold starts		Y		Voltage loss ride through time	30 cycles	3 cycles
Anti-backspin timer		Y	Y	AC Current Inputs	4	4
Transition (Time / current)		Y	Y	Analog Outputs	1	1
Transition trip		Y	Y	Programmable Digital Inputs	2	1
Emergency Restart		Y		Trip Contacts	1	1
Load Shed		Y		Alarm Contacts	1	1
Reversing Motors		Y	Y	Auxiliary Contacts	2	1 + Inc Seq
Armed/Disarmed Feature		Y		Programmable Outputs	Y (3)	Y (1)
Speed switch		Y		Local Display	Y	Y
				LED's (Local targets)	Y	Y
<u>Monitoring Functions</u>				<u>Standards</u>		
Amps		Y	Y	ANSI	Y	
Percent Full Load		Y	Y	IEC	Y	
% Phase Unbalance (Neg. / Pos.)		Y		UL 1053 Ground Fault	Y	
Thermal Capacity Used (% I2T)		Y		UL	Y	Y
Time remaining until next start		Y		CUL	Y	
RTD Temperature		Y	Y	NEMA Rating	12	12
Hottest RTD		Y	Y			
Maximum Run Current (I _{max})		Y				
Trip History		Y	Y			
Trip Target/Alarm Data		20	Y (1)			
<u>Events</u>						
Motor Start Data		Y(4)				
Motor Start Profile Plot		Y(4)				
Log Book (# of events)		100				
Clock & Time Stamping		Y				

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All of the protection features that were in the IQ1000II are in the MP3000. The MP3000 adds several new features that enhance its performance and that should be reviewed for user and application benefits. These will be discussed in the setting conversion section of this document and in detail in the MP3000 IL 17562.

For relay communications, the BPONI was recommended for the IQ1000II. The BPONI can be used with the MP-3000 when it is set to communicate like an IQ1000II. The IPONI must be used for the MP-3000 communications mode.

The MP-3000 can be fitted in the Quick Release Drawout Case that the IQ1000II was not available in. For more information please refer to the MP-3000 Drawout Case Addendum to IL. 17562.

3. MP-3000 Enhancements

- 1 The new MP-3000 Motor Protection relay features our exclusive ***Intel-I-Trip*** Intelligent Overload Protection with adaptive trip characteristics based on Motor nameplate constants, RTD readings and memory.
- 2 The MP-3000 Motor Protection relay meets UL1053 Standards for Ground Fault protection. It is the only motor relay to be approved to this stringent UL standard.
- 3 The MP-3000 Motor Protection relay has a new and improved power supply that can ride through a voltage sag or loss for 30 cycles without dropping out and taking the motor off line.
- 4 The MP-3000 Motor Protection relay is available in an optional Quick Release Drawout case that makes removal and replacement fast and easy.
- 5 New Armed/Disarmed feature for trip free installation with Quick Release Drawout Case.
- 6 RTD tripping can be turned off. This will remove the biasing in the motor thermal model and MP-3000 overload tripping will operate as if there were no RTD's connected. An RTD alarm set point can be made and be configured to operate an Auxiliary relay for tripping if desired.
- 7 User selectable relay operation for relay failure detection to: trip only, alarm only or trip and alarm.
- 8 We've added a Y2K compliant real time clock for date and time stamping of trips, alarms and events.
- 9 Expanded memory for recording and logging of events, trip data, alarms, history and starts.
- 10 New motor starting profile plot versus protection limits.
- 11 New face plate and user interface. Settings and data are organized into pages under 4 main heading groups. The main headings are Monitor, Settings, History and Events.
- 12 Includes comprehensive RTD monitoring and error checking for additional security against nuisance operations.

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- 13 Exclusive Mechanical Load Shedding feature provides overload indication to control upstream processes averting unnecessary motor overload shutdown maintaining process.
- 14 Down load settings or retrieve metered and historical values via the communications port.
- 15 User configurable inputs and outputs for greater application flexibility.
- 16 All contact outputs can be individually programmed for Mode 2 Failsafe operation.
- 17 New options for transition function on time and/or current.
- 18 Emergency override function resets start block timers and thermal bucket to permit operator restart capabilities.
- 19 Protection functions are operational during program mode.
- 20 Ground sensing from either a Ground Ct or from the phase Ct residual connection.

4. MP-3000 Factory Default Setting

The MP-3000 comes configured as an IQ1000II from the factory. The MP-3000 has enhanced features and functions that expand its operation and that modify the application settings slightly from the IQ1000II. The MP-3000 default settings and configuration are fully equivalent to the IQ1000II function and operation.

The MP-3000 Motor Protection relay is shipped configured as listed below and shown in figure 1.

Caution: The MP-3000 must have the proper motor parameters set before trying to start and operate the motor.

- 60 Hz, Non-reversing motor operation
- I2T and locked rotor protection functions set to minimum pickup and times
- RTD trip and alarms are set to operate at 100 and 80 °C respectively
- Ground fault is set to 24% which is equivalent to the IQ1000II setting of 12 A
- IOC, Underload and Phase Unbalance functions are set to “Off”
- Jam trip is set to 1000%
- Ground fault alarm and underload alarm set to Off
- I2t Overload alarm at 80%
- Jam alarm set for 1000%
- Phase unbalance alarm set for 10%
- Starts per time function is turned off.
- Transition current is set to 130% FLA with a transition time of 10 seconds. If the current does not fall below 130% FLA in 10 seconds then the relay will trip.

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- Incomplete sequence report back time is set to 1 second if discrete input #2 does not receive a signal within that time a trip will occur. **Note: MP-3000 is shipped without the jumper on input 2 as in the IQ1000II. If the Incomplete Sequence function is not used then it must either be disabled through the settings or jumpers must be added between terminals 6 and 10 and terminals 7 and 9. These are different jumpers than those found shipped on the IQ1000II.**
- Discrete input #1 is configured the same as the IQ1000II for Remote Reset
- Discrete input #2 is configured the same as the IQ1000II for Incomplete Sequence. **Note: The MP-3000 is shipped from the factory without jumpers on the Incomplete Sequence Input. Proper jumpers must be added or the incomplete function must be disabled if not used.**
- All trip functions are mapped to the Trip Output Relay. This output is configured for Mode 2, failsafe operation.
- All Alarm Functions are programmed to the Alarm Output Relay. This output is configured for Mode 2, failsafe operation. The Alarm Relay will also operate for Relay Self-check Failures.
- Mode 2 operation is a normally energized relay that will operate or change states for Power Supply Failures.
- The Aux. 1 Relay Output is configured to operate on I2T overload trip function. Aux. 1 is configured for Mode 1 non-failsafe operation.
- Aux. 2 Relay Output is configured to operate on Transition. Aux. 2 is configured for Mode 1 non-failsafe operation.
- Analog output set for maximum output (20 ma) when the average current is at 125% Full Load Amps. It will provide minimum output (4 ma) when the average current is 0 % FLA.
- I2T Trip AUTO reset after % I2T falls below %I2T Alarm set point
- Program when motor is STOPPED only
- Emergency Override push button DISABLED
- Communications output in IQ1000II Mode (Limited functionality)
- Relay Failure operates both the TRIP and ALARM Outputs

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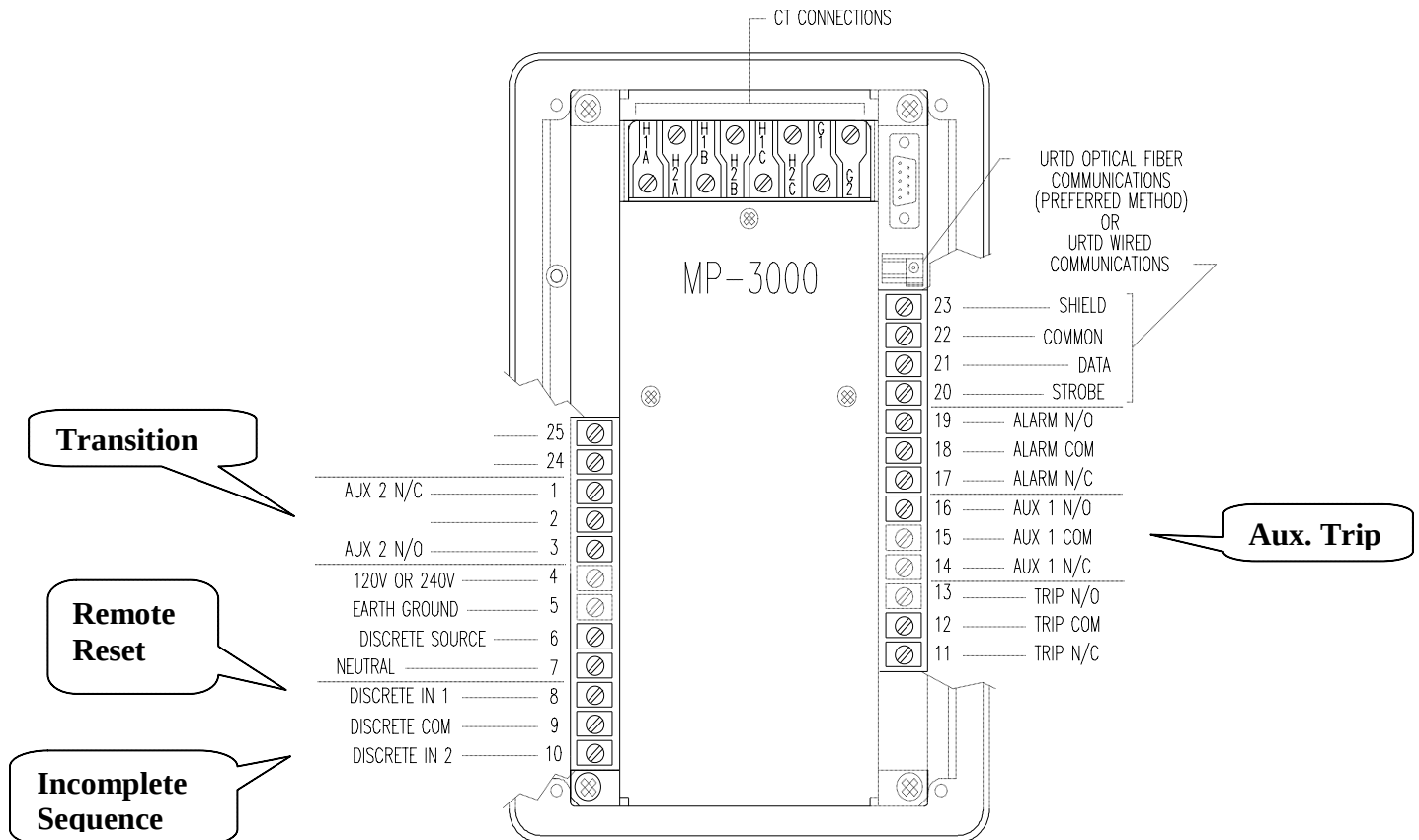


Figure 1. MP-3000 Rear Panel Terminal Designation - Factory Configuration

5. Mounting and Electrical Connections

The MP-3000 uses the IQ1000II panel cut out. If the IQ1000II is being replaced with the MP-3000 the wire termination will be identical except for the wiring of the discrete inputs. Figure 1 shows the relay rear view and terminal designation. The call outs show factory default configuration. Figure 2 shows the standard MP-3000 connection diagram. Figure 3 shows the residual ground connection. Figure 4 shows the wiring for the discrete inputs.

The differences in the installation between the MP-3000 and IQ1000II are:

- The MP-3000 is one-half inch deeper than the IQ1000II
- The MP-3000 does not come from the factory with jumpers wired from terminals 10 to 4 and 9 to 6. These jumpers were required to defeat the Incomplete Sequence function in the IQ1000II. If the incomplete sequence function is not used in the MP-3000 then we recommend disabling it through the relays setting. If the Incomplete Sequence function is not used and not disabled then jumpers must be added to terminals 6 to 10 and 7 to 9 on the MP-3000.
- Jumper 6 – 9 on the IQ1000II was used for the remote common for the remote inputs and is no longer needed with the MP-3000. This is the only significant connection

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and wiring difference between the MP-3000 and the IQ1000II. This jumper tied the Remote Input common to the relay power transformer and was used to keep the voltage across the remote inputs to the rated 120 Vac. This was critical for 240 Vac applications as this connection actually raised the remote common to 120 Vac keeping the voltage difference across the inputs to 120 Vac (240 minus 120). Terminal 6 on the MP-3000 now provides a constant 120 Vac output for the discrete inputs wetting voltage. Figure 4 shows how to wire the MP-3000 discrete inputs for either 120 Vac or 240 Vac control power.

- For applications where the IQ1000II is being replaced with the MP-3001 or 3002 in the Quick Release Drawout Case then the cutout remains the same but the wire termination points and locations are different. This replacement may require rewiring to the Protective Relay. Please refer to the Drawout Case Addendum to IL 17562.
- External mounting of the URTD module and communications PONI are the same.

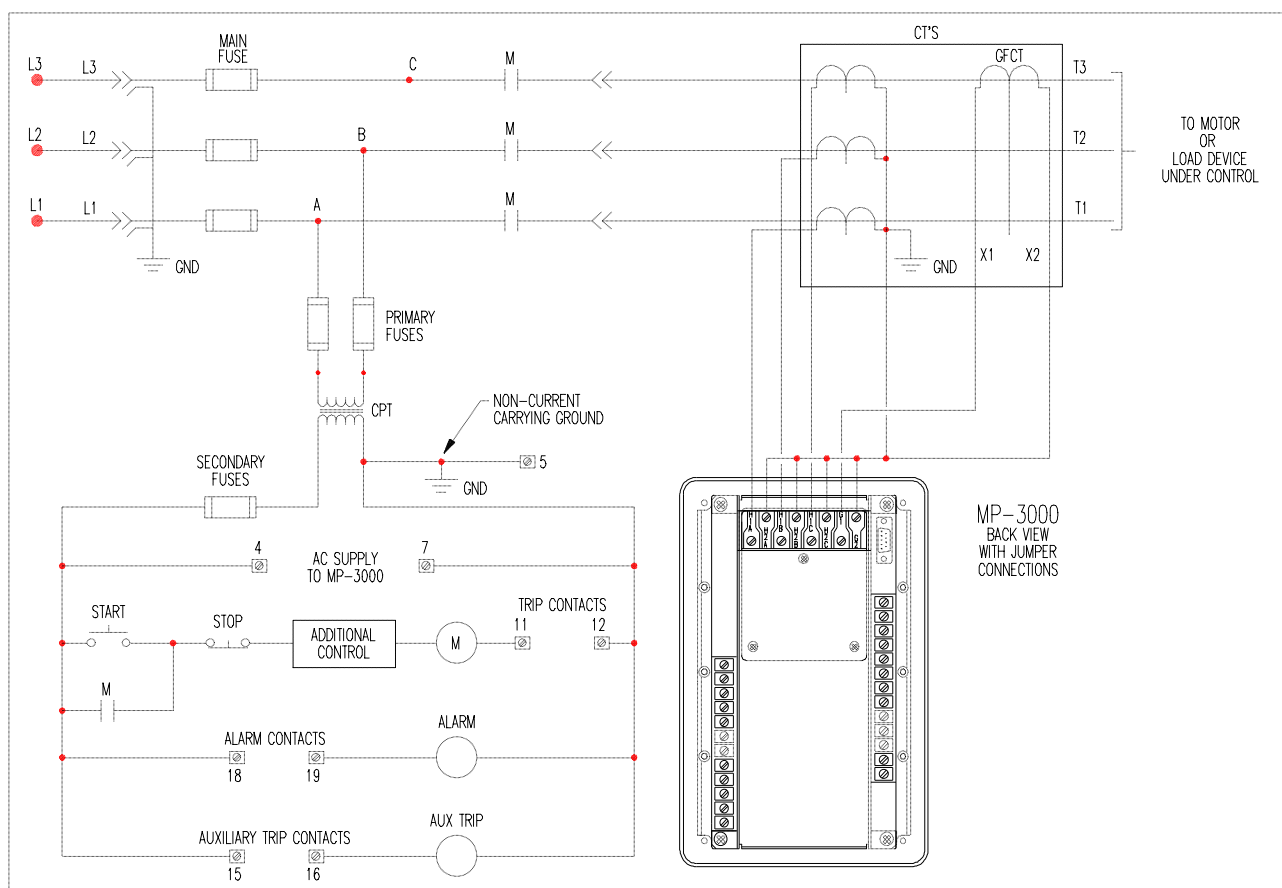


Figure 2. Typical MP-3000 Connection Diagram

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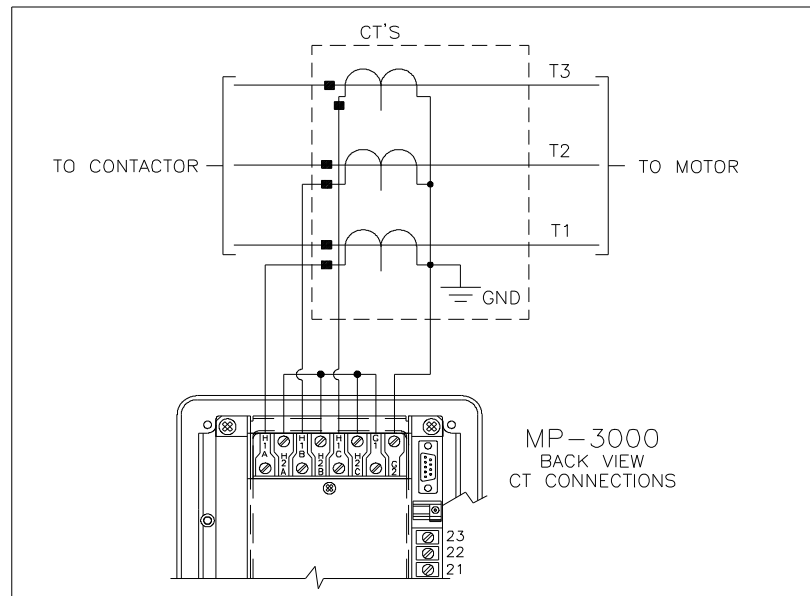


Figure 3. Residual Ground Connection

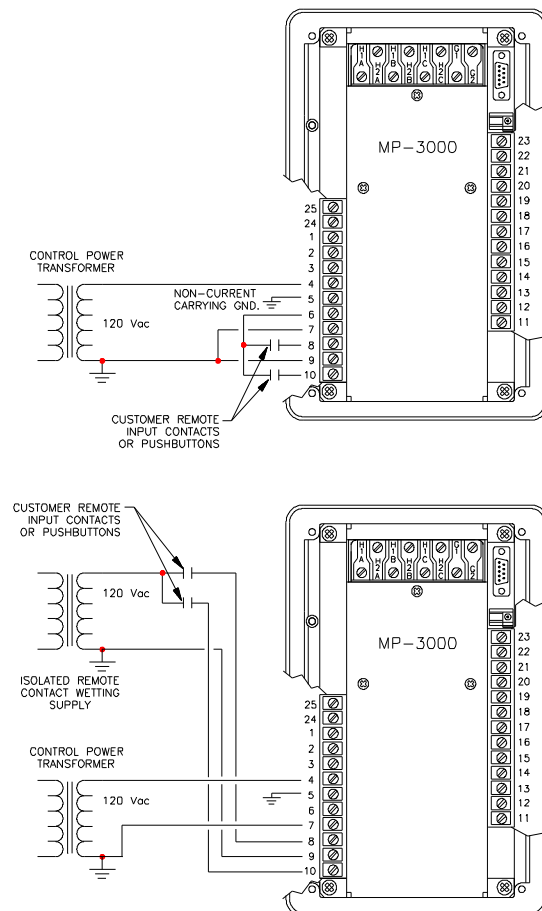


Figure 4: Discrete input wiring connections

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6. Setting Conversion from the IQ1000II to the MP-3000

The MP-3000 Motor Protection and Control functions are based on the field proven algorithms of the IQ1000II and therefore have very similar protection setting requirements. The MP-3000 has many more features and settings that the user can take advantage of and should consider.

This section covers those settings that are taken directly from the IQ1000II, those settings that require modification from the IQ1000II and those setting that are brand new in the MP-3000.

The IQ1000II has 2 modes of operation that are controlled via the key switch. There is a run mode and a program mode. The IQ1000II had to be in the Program Mode and the motor stopped (depending on set point 51) for the relay to be set. The protection was disabled while the relay was in the Program Mode. The relay set points are sequentially addressed in the IQ1000II.

The MP-3000 has a latching cover that restricts access to the Program Mode and that accepts a wire meter seal for security. With the cover closed, setting changes can not be made. The user must open the latched cover and enter the program mode to change settings. The MP-3000, as shipped from the factory, will not permit setting changes while the motor is running. The MP-3000 can be programmed to accept setting changes while in the run mode just as the IQ1000II could. If the relay is configured to permit setting changes when the motor is running then the MP-3000 will provide motor protection while in the Program Mode. The protection uses the preexisting settings prior to entering the Program Mode until all setting changes are made and the Program Mode is exited. If a trip occurs while in the Program Mode, then the relay will automatically exit the Program Mode and any setting changes made will be lost.

The settings for the MP-3000 have been logically grouped into pages. Enter the Program Mode and press the page up button to scroll through setting pages. Each page has a list of settings that are scrolled through using the Line up and down arrows. Values and options for each setting are changed using the Value up and down arrow keys.

The **52 set points of IQ1000II** are covered in the **MP-3000 set point pages 1, 2, 3, 4, 5, 6, 9, 11 and 12**. Pages 6, 9 and 11 define the configuration for the Discrete Input #1, Aux. 1 and analog outputs and can be left alone if the IQ1000II settings 46, 47 and 48 are in default configuration or if these inputs and outputs are not used. The other MP-3000 setting pages do not need to be set to properly operate and protect the motor but should be reviewed in order to take advantage of the new product features.

The MP-3000 setting pages are grouped into the following categories:

- **Page 1 – Motor Page:** These are the primary Motor Protection settings that define the Intel-I-TripTM Overload (I2T) Trip characteristics.
- **Page 2 – RTD Page:** Used to set temperature tripping and alarm values when the optional URTD module is connected.
- **Page 3 – Trip Settings:** Used to set ground fault, IOC, Jam, underload and unbalance trip values and time delays.

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- **Page 4 – Alarm Settings:** Used to set alarm thresholds and time delays for Ground currents, %I2T overload, Jam, Underload and Phase unbalance.
- **Page 5 – Start Control:** Used to program motor starting control and restrictions into the MP-3000.
- **Page 6 – Discrete Input #1:** Used to configure input #1. The factory configuration is Remote Reset, the **same as the IQ1000II**.
- **Page 7 – Discrete Input #2:** Used to configure input #2. The factory configuration is Incomplete Sequence, the **same as the IQ1000II**.
- **Page 8 – Alarm Relay Output:** Used to configure Alarm Relay Output. The factory configuration is **same as the IQ1000II plus** alarms for RTD failures and MP-3000 relay failures. This output is set for Mode 2 Failsafe operation to cover power supply failure alarm feature. Set to mode 1 in Systems Configuration Page (page 12) to disable power supply failure alarm when frequent power disruptions to the relay are common.
- **Page 9 – Aux. 1 Relay Output:** Used to configure the Aux. 1 output. The factory configuration is to operate on I2T Trip, the **same as the IQ1000II**.
- **Page 10 – Aux. 2 Relay Output:** Used to configure the Aux. 2 output. The factory configuration is to operate on Transition, the **same as the IQ1000II**.
- **Page 11 – Analog Output:** Used to configure the 4 to 20 ma Analog outputs. The factory configuration is for maximum output at 125 % FLA, the **same as the IQ1000II**.
- **Page 12 – MP-3000 System Configuration:** Used to configure the relay system configuration for output Mode 1 or Mode 2 operation, program while running and emergency override enable, clock and communication option settings.
- **Page 13 – Testing:** Used for testing the relay with a single current test source and to exercise the output relays, analog output and LED's. The testing page will also display the status of the discrete inputs.
- **Page 14 – Reset:** Used to reset the counters registered in the History Mode.

Table 2 is a cross-reference showing the IQ1000II set point items associated with each MP-3000 setting. N/A is used where no setting is required for IQ1000II replacements. A * is used to indicate that the setting should be reviewed because it is not a direct transfer from the IQ1000II or for possible application benefits. The setting applications to review are the ground overcurrent function, IOC, phase unbalance, transition function, incomplete sequence report back applications, motor start conditions, I/O configuration and relay system configuration.

- **GCT:** The MP3000 can now be used with various ground Ct connections and ratios and must be defined in the settings. This requires the Ct ratio numerator (i.e. 240 is input for a 240/5 or 240/1 A Ct ratio). The IQ1000II required a 50/5 Ground CT; therefore, the MP-3000 default setting is 50. Ground protection, alarming and/or monitoring can be easily added if it was not used with the IQ1000II. Simply make a

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residual connection of the three phase CT's and connect the MP-3000 Ground Current inputs in the return path. Set the ground Ct ratio the same as the Phase Ct (PCT) ratio.

- **GFT:** The MP-3000 ground current pick up setting is in percent of the ground Ct ratio. For example, if GCT is set to 120 A and GFT is set to 20% then the relay will operate at 24 A primary ground current ($120\text{A} \times 20\% = 24\text{ A}$). The IQ1000II ground current set point is in primary amps based on a fixed 50/5 ground Ct. To convert the IQ1000II setting for the MP-3000 simply take the IQ1000II ground setting (set point # 11) and divide by 50 A times 100%. Example: IQ set at 3 A. MP-3000 setting is $3/50 \times 100\% = 6\%$
- **GFSD:** The MP-3000 ground start delay timer has a range of 2 to 60 cycles in 1-cycle steps instead of 1 to 20. The minimum trip time for the ground element is 2 cycles. If the IQ was set to the maximum value of 20 cycles then you may consider extending the time for the MP-3000.
- **IOC:** The MP-3000 combines two IQ1000II set points into one. IQ set point 14 is on/off and set point 15 is the pick up in % full load amps. The MP-3000 set point scrolls off, 300 to 1600% FLA.
- **IOCS:** The MP-3000 ground start delay timer has a range of 2 to 60 cycles in 1-cycle steps instead of 1 to 20. The minimum trip time for the ground element is 2 cycles. If the IQ was set to the maximum value of 20 cycles then you may consider extending the time for the MP-3000.
- **UBT, UBSD & UBTR:** These are new settings that must be made for phase unbalance tripping. The IQ1000II had a fixed pick up value of 50% and setting 32 (I2T TRIP / 2 SEC) either disabled unbalance trip (I2T TRIP) or trip with 2 second time delay (2 SEC). The MP-3000 has a UBT setting range of 4 to 40%. If item 32 of the IQ1000II was set to 2 SEC then simply set UBT to 40%. UBSD and UBTR are start and run time delays. Both have a setting range and can be set to 2 seconds or longer. If an unbalance is detected during starting then the trip time will equal the total of the start delay time and the run delay time.
- **GFA:** This is a new set point for ground current alarm level. It provides an alarm indication and logging when the ground current exceeds its threshold. To alarm only on ground current, the user would set GFT above to off and then set an appropriate value for GFA. GFA is set in percent of the GCT setting. Example: If GCT is set for 50 and GFA to 5% then the $GFA = 5\% \times 50 = 2.5\text{ A}$ primary ground current.
- **TBS:** Time Between Starts is a new setting that lets the user set a minimum time that must transpire after a attempt before another start can take place. This timer begins timing after a start is declared.
- **NOCS:** Number of Cold Starts is a new setting that can provide for multiple cold starts as specified by the motor manufacturer.
- **TRN:** The Transition control function for reduced voltage starters have expanded options of time and current operation. The motor transition is a point in the motor start log that is recorded. It provides useful information if set properly. The IQ1000II Item 39 set the logic to either (TRN TOUT) transition the motor after transition time

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(TRNT) or (TRP TOUT) trip the motor after transition time (TRNT). Set the MP-3000 to:

- **TRN T+C** for IQ setting of TRN TOUT – In this mode, the MP-3000 will transition on either time or current. It functions just like the IQ1000II. If the motor current has not transitioned below (TRNC) setting after time out (TRNT) then it will transition. This setting should be used for logging purposes if the transition function is not required. It is recommended to set the transition time (TRNT) to a maximum and the transition current (TRNC) to 150%. This will provide a measured time from start to when the motor current dropped to 150% of FLA.
 - **TRN I** for IQ setting of TRP TOUT. In TRN I mode, the MP-3000 will trip after time out (TRNT) if the motor current has not dropped below setting (TRNC). This is the same operation as the IQ1000II setting TRP TOUT.
 - **TRN TIME** is a new mode that transition the MP-3000 from start to run at a fixed time. This would be used when the starter had an operating time limit in the reduced voltage mode. This is a transition only mode and will not cause a trip.
 - **TRN T/C** is a new mode that requires both the time and current conditions to be met for transition. The MP-3000 will transition after time out (TRNT) if the current is below (TRNC). If the current is above (TRNC) then it will trip.
- **INSQ:** The Incomplete Sequence Trip function can be turned off in the MP-3000 where OFF is the recommended setting if this function is not required. The IQ1000II came with a pair of jumpers across terminals {4 and 10} and {6 and 9} which defeated Incomplete Sequence Tripping. The Incomplete Sequence Tripping function can be defeated with jumper similar to the IQ1000II. The MP-3000 requires jumpers to be added between terminals {6 and 10} and {7 and 9}.
- **INSQ TRN or INSQ ST:** This setting defines the incomplete sequence timer starting point. TRN begins timing when the relay declares a transition as defined above. ST begins timing when the MP-3000 declares a start which occurs when the current goes from zero to above 30% FLA. Use INSQ TRN setting for IQ1000II replacement.
- **ABKS:** The Anti-Backspin Timer had a setting range from 0 to 600 seconds in the IQ1000II. MP-3000's with firmware versions 1.06 or less have a setting range from 1 to 240 minutes in 1-minute steps. Later versions have a range from 0 to 3600 seconds.
- **SP DI 2:** Discrete input # 2 is set for Incomplete Sequence function just like the IQ1000II; however, the MP-3000 is not supplied with the jumpers in place to defeat this function. If the Incomplete Sequence function is not used then either this function needs to be turned OFF as stated above or jumpers need to be added per above. (Refer to section 5 of this application note.) If the Incomplete Sequence function is not used then this input may be configured for another function. Refer to the table 2 and IL17562 for more information.
- **SP AREL, AUX1, AUX2:** The outputs of the MP-3000 are configurable and can be changed from the factory preset values. It should be noted that the Alarm Relay is now configured for a failsafe mode (mode 2, normally energized), and will also

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operate for MP-3000 relay failures or power supply failures. Refer to IL17562 for additional application considerations and table 4.3 for factory preset values.

- **SP SYS:** The MP-3000 has a relay operating system that should be reviewed and settings made. These include setting for the output operation mode (failsafe or non-failsafe), clock and relay operations for programming, auto reset, communications and disarming the protection. Please refer to IL 17562 for detailed discussions about the system settings.
- **SP TEST:** This page is used when testing the MP-3000. It sets up the operation for either single-phase or three-phase operation test mode and can be used to exercise the output relays, analog output and LED's. This page will also report the state of the discrete inputs. Operation of the outputs is only permitted when the motor is stopped.
- **SP RESET:** This page is used to reset the History information. Please refer to IL 17562 for more information on the operation of this page.

Note: The MP-3000 can be set via a computer through an optional communication port and Eaton provided software.

7. MP-3000 Monitoring, History and Log Mode Overview and Operation

The IQ1000II provided the ability to view monitored information such as current and RTD temperatures, run time, remaining starts and number of trips etc. The user could also view settings and the last trip information.

The MP-3000 provides much more information that is easy to find and review. Four push buttons with imbedded LED's provide direct access to Monitor Mode, View Setting Mode, History Mode and Log Mode. Once in a mode, the Page Up button scrolls through major groupings. Line Up scrolls through the various displays. Value Up will provide additional information available for each item such as date and time etc.

Monitor Mode provides readings on current, RTD temperatures, Motor values like %I2T and time until next start and relay date and time. View setting mode lets you review all settings without the possibility to changing. The History Mode has counters for number of trips, Operational counter, max running current etc. The Log Mode has three major log functions, BOOK, EVENT and START.

- **BOOK** records the last 100 events in chronological order with date and time stamping. An event is a Start, Stop, Alarm, Trip or other operation.
- **EVENT** records the last 20 trip or alarm operations. Details of motor currents, unbalance, I2T and RTD values are stored in nonvolatile memory with date and time stamp.
- **START** records information on the last 4 starts in nonvolatile memory. Detailed information about the motor starting currents, unbalanced conditions and run transition data is logged with date and time. The MP-3000 also records a Motor Start Profile record for each start that can be viewed with software from Eaton. Figure 5 is an example of the Start Profile along with the MP-3000 Overload, JAM and IOC trip characteristics overlade for application review.

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8. IMPACC / PowerNet / PowerPort Communications

The MP-3000 requires a PONI (Product Operated Network Interface) for communications. It can be used with the IPONI and RS-232 PONI.

The MP-3000 can be configured to emulate an IQ1000II that permits using a BPONI. The set points for the MP-3000 must coincide with IQ1000II ranges in order for the MP-3000 to properly communicate monitored information with an IMPACC system.

The MP-3000 communication capability permits the viewing of the monitored values, settings, history data and logged information including the motor start profile. The relay settings can be down loaded over the communications port and the motor can be remotely stopped.

Please refer to Section 10 of I.L. 17562 for detailed information on the MP-3000 communications.

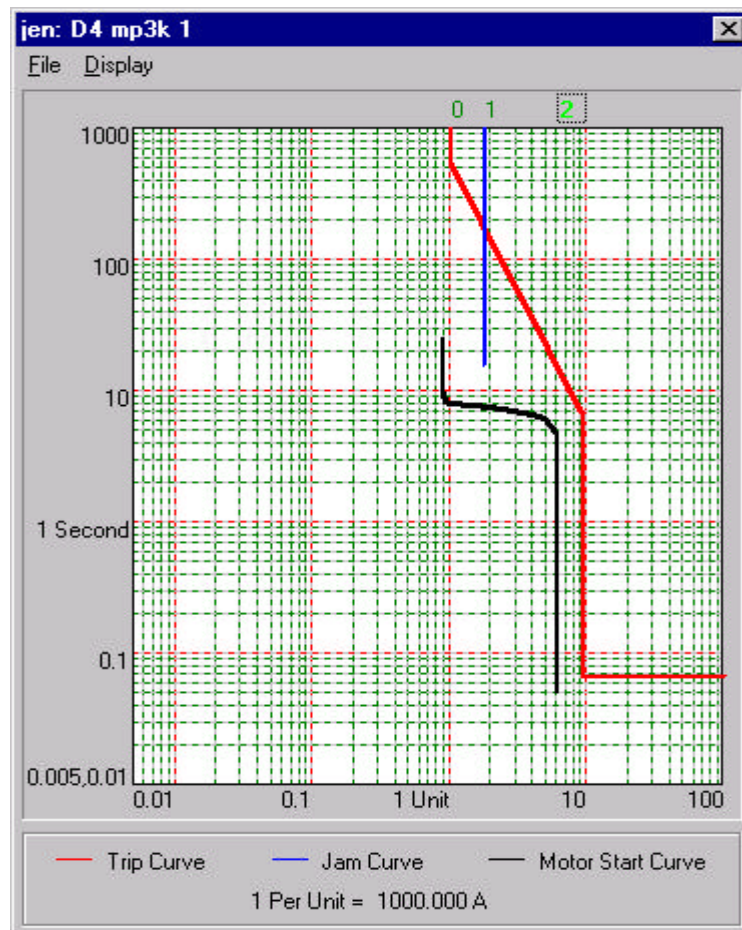


Figure 5. Motor Start Profile from C-H PowerPort and PowerNet Software

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
	SETPOINT	SETPOINT PROGRAM MODE		N / A	
P1	SP MOTOR	SETPOINTS FOR MOTOR CONSTANTS		N / A	
1	FLA XXXX	FULL LOAD AMPS	10-3000 amps (1 amp. increments)	42	
2	LRC XXXX	LOCKED ROTOR CURRENT % OF FLA	300-1200 % (1 % increments)	17	
3	LRT XXX	MAXIMUM ALLOWABLE STALL TIME IN SECONDS	1-120 sec. (1 sec. increments)	18	
4	UTC XXX	ULTIMATE TRIP CURRENT IN % FLA	85-125% (1% increments)	19	
5	PCT XXXX	PHASE CT RATIO NUMERATOR IN PRIMARY AMP	10-4000 A (increments of 1)	52	
6	GCT XXXX	GROUND CT RATIO NUMERATOR IN PRIMARY AMP	10-4000 A (increments of 1)	N / A *	
7	FREQ 50 FREQ 60	50 OR 60 HERTZ LINE FREQUENCY	Toggles between FREQ 50 and FREQ 60	43	
8	REV NON REV	REVERSING OR NONREVERSING STARTER	Toggles between REV and NONREV	45	
P2	SP RTD	SETPOINTS FOR RTD INPUTS		N / A *	
1	RTD IN C RTD IN F	DISPLAYED IN DEGREES C OR F	Toggles between RTD IN C and RTD IN F	2	
2	WD T XXX	WINDING TEMP TRIP	0-199°C, OFF / 32-390°F, OFF (1°increments)	3	
3	WD A XXX	WINDING TEMP ALARM	0-199°C, OFF / 32-390°F, OFF (1°increments)	7	
4	MB T XXX	MOTOR BEARING TRIP	0-199°C, OFF / 32-390°F, OFF (1°increments)	4	
5	MB A XXX	MOTOR BEARING ALARM	0-199°C, OFF / 32-390°F, OFF (1°increments)	8	
6	LB T XXX	LOAD BEARING TRIP	0-199°C, OFF / 32-390°F, OFF (1°increments)	5	
7	LB A XXX	LOAD BEARING ALARM	0-199°C, OFF / 32-390°F, OFF (1°increments)	9	
8	AX T XXX	AUXILIARY TRIP	0-199°C, OFF / 32-	6	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
			390°F, OFF (1°increments)		
9	AX A XXX	AUXILIARY ALARM	0-199°C, OFF / 32-390°F, OFF (1°increments)	10	
10	DIAG ON DIAG OFF	ALARM ON RTD FAILURE DIAGNOSTIC	Toggles between DIAG ON and DIAG OFF	N / A	
P3	SP TRIP	SETPOINTS FOR TRIP SETTINGS		N / A	
1	GFT XXX	GROUND FAULT TRIP LEVEL IN % OF GROUND CT RATIO NUMERATOR	2-55% of Ground CT ratio numerator	11 *	
2	GFSD XX	GROUND FAULT START DELAY IN CYCLES	2-60 AC cycles (1 cycle increments)	12 *	
3	GFRD XX	GROUND FAULT RUN DELAY IN CYCLES	0-60 AC cycles (1 cycle increments)	13	
4	IOC XXXX	INSTANTANEOUS OVERCURRENT IN @ FLA	300-1600%, OFF (1% increments)	14 & 15 *	
5	IOCSD XX	INSTANTANEOUS OVERCURRENT START DELAY IN CYCLES	2-60 AC cycles (1 cycle increments)	16 *	
6	JMT XXXX	JAM TRIP LEVEL IN @ FLA	100-1200%, OFF (1% increments)	23	
7	JMSD XXX	JAM TRIP AND ALARM START DELAY IN SECONDS	0-120 sec. (1 sec. increments)	24	
8	JMTR XXX	JAM TRIP RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	25	
9	ULT XXX	UNDERLOAD TRIP LEVEL IN @ FLA	6-90%, OFF (1% increments)	27	
10	ULSD XXX	UNDERLOAD TRIP AND ALARM START DELAY IN SECONDS	0-120 sec. (1 sec. increments)	28	
11	ULTR XXX	UNDERLOAD TRIP RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	29	
12	UBT XXX	PHASE UNBALANCE TRIP LEVEL	4-40%, OFF (1% increments)	32 *	
13	UBSD XXX	PHASE UNBALANCE TRIP AND ALARM START DELAY IN SECONDS	0-120 sec. (1 sec. increments)	32 *	
14	UBTR XXX	PHASE UNBALANCE TRIP RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	32 *	
P4	SP ALARM	SETPOINTS FOR ALARM SETTINGS		N / A	
1	GFA XXX	GROUND FAULT ALARM LEVEL IN @ OF GROUND CT RATIO NUMERATOR	2-55% of Ground CT ratio numerator, OFF (1% increments)	N / A *	
2	I2TA XXX	I2T ALARM LEVEL IN @ FULL OF I2T	60-99%, OFF (1%	20	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
		TRIP CAPACITY	increments)		
3	JMA XXXX	JAM ALARM LEVEL IN @ FLA	100-1200%, OFF (1% increments)	22	
4	JMAR XXX	JAM ALARM RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	25	
5	ULA XXX	UNDERLOAD ALARM LEVEL IN @ FLA	6-90%, OFF (1% increments)	26	
6	ULAR XXX	UNDERLOAD ALARM RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	29	
7	UBA XXX	PHASE UNBALANCE ALARM LEVEL	4-40%, OFF (1% increments)	30	
8	UBAR XXX	PHASE UNBALANCE ALARM RUN DELAY IN SECONDS	0-240 sec. (1 sec. increments)	31	
P5	SP START	SETPOINTS FOR START SETTINGS		N / A	
1	ST/T XXX	STARTS PER TIME ALLOWED	1-10 starts/time, OFF (increments of 1)	33	
2	T/ST XXX	TIME ALLOWED FOR STARTS COUNT IN MINUTES	1-240 minutes, OFF (1 minute increments)	34	
3	TBS XXX	TIME BETWEEN STARTS IN MINUTES	1-240 minutes, OFF (1 minute increments)	N / A *	
4	NOCS X	NUMBER OF COLD STARTS ALLOWED	1-5 starts (increments of 1)	N / A *	
5	TRNC XXX	MOTOR START TRANSITION CURRENT LEVEL IN @ FLA	10-300% (1% increments)	37	
6	TRNT XXX	MOTOR START TRANSITION TIME IN SECONDS	0-480 sec. (1 sec. Increments)	38	
7	TRN TIME TRN I TRN T+C TRN T/C	TRANSITION ON EVENT TRN TIME – ON TIME ONLY, TRN I – ON CURRENT ONLY, TRN T+C – ON TIME OR CURRENT, TRN T/C – ON TIME AND CURRENT	Choose one of the four Values that allow a start to run transition: TRN TIME, TRN I, TRN TORC, or TRN TANC. Refer to setpoints 45 and 46	39 *	
8	INSQ XXX	INCOMPLETE SEQUENCE REPORT BACK TIME IN SECONDS ON DISCRETE INPUT 2	1-240 sec., OFF (1 sec. Increments)	40 *	
9	INSQ TRN INSQ ST	INCOMPLETE SEQUENCE START TIMER EVENT INSQ TRN – START TO RUN TRANSITION	Toggles between INSQ TRN and INSQ ST	N / A *	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
		INSQ ST – STOP TO START TRANSITION			
10	LAT XXX	LONG ACCELERATION TIME IN SECONDS	1-1200 sec., OFF (1 sec. increments)	N / A	
11	ZSW ON ZSW OFF	ZERO SPEED SWITCH ON DISCRETE INPUT 1 ON OR OFF	Toggles between ZSW ON and ZSW OFF	N / A	
12	ABKS XXX	ANTI-BACKSPIN DELAY TIME IN MINUTES	1-240 minutes, OFF (1 minute increments)	41	
P6	SP DI 1	SETPOINTS FOR DISCRETE INPUT NUMBER 1		N / A	
1	REM RST REM TRIP DIF TRIP MTR STOP RST DBL EMG OVR ZERO SW	CONFIGURE DISCRETE INPUT 1 - - REM RST – REMOTE RESET REM TRIP – REMOTE TRIP DIF TRIP – DIFFERENTIAL TRIP MTR STOP – MOTOR STOP DETECTION RST DBL – RESET DISABLE EMG OVR – EMERGENCY OVERRIDE ZERO SW – ZERO SPEED SWITCH CONFIGURE DISCRETE INPUT 1 – ZERO SW – ZERO SPEED SWITCH TO GET ANY OTHER FUNCTION SET ZERO SPEED SWITCH SETPOINT TO OFF	Use Value pushbuttons to choose one of the seven functions at left to configure discrete input 1. If the zero speed switch function is enabled in the SP START page then this input is automatically configured to ZERO SW and no other setting is possible until the zero speed switch function in SP START is off.	46	
P7	SP DI 2	SETPOINTS FOR DISCRETE INPUT NUMBER 2		N / A *	
1	REM RST REM TRIP DIF TRIP MTR STOP RST DBL EMG OVR INC SEQ	CONFIGURE DISCRETE INPUT 2 - - REM RST – REMOTE RESET REM TRIP – REMOTE TRIP DIF TRIP – DIFFERENTIAL TRIP MTR STOP – MOTOR STOP DETECTION RST DBL – RESET DISABLE EMG OVR – EMERGENCY OVERRIDE INC SEQ – INCOMPLETE SEQUENCE CONFIGURE DISCRETE INPUT 2 – INC SEQ – INCOMPLETE SEQUENCE TO GET ANY OTHER FUNCTION SET INCOMPLETE SEQUENCE TIME	Choose one of the seven functions at left to configure discrete input 2 only if the incomplete sequence timer is set off in the SP START page. If INC SEQ is chosen then the setpoint in the SP START page is automatically set to 1 second.	N / A *	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
		SETPOINT TO OFF			
P8	SP AREL	SETPOINTS FOR ALARM RELAY OUTPUT CONFIGURATION		N / A *	
1	GF A ON GF T ON GF OFF	ENABLE GROUND FAULT ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between GF A ON, GF T ON, and GF OFF	N / A	
2	I2T A ON I2T T ON I2T OFF	ENABLE I2T ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between I2T A ON, I2T T ON, and I2T OFF	N / A	
3	JAM A ON JAM T ON JAM OFF	ENABLE JAM ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between JAM A ON, JAM T ON, and JAM OFF	N / A	
4	UL A ON UL T ON UL OFF	ENABLE UNDERLOAD ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between UL A ON, UL T ON, and UL OFF	N / A	
5	UB A ON UB T ON UB OFF	ENABLE PHASE UNBALANCE ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between UB A ON, UB T ON, and UB OFF	N / A	
6	WD A ON WD T ON WD OFF	ENABLE WINDING TEMP ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between WD A ON, WD T ON, and WD OFF	N / A	
7	MB A ON MB T ON MB OFF	ENABLE MOTOR BEARING ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between MB A ON, MB T ON, and MB OFF	N / A	
8	LB A ON LB T ON LB OFF	ENABLE LOAD BEARING ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between LB A ON, LB T ON, and LB OFF	N / A	
9	AX A ON AX T ON AX OFF	ENABLE AUXILIARY RTD TEMP ALARM OR TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between AX A ON, AX T ON, and AX OFF	N / A	
10	SX A ON SX T ON SX OFF	ENABLE STARTS PER TIME TRIP OR ALARM TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between SX A ON, SX T ON, and SX OFF	N / A	
11	TBS T ON TBS OFF	ENABLE TIME BETWEEN STARTS TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between TBS A ON, TBS T ON, and TBS OFF	N / A	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
12	RTDF ON RTDF OFF	ENABLE INDIVIDUAL RTD CHANNEL FAILURE TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between RTDF ON and RTDF OFF	N / A	
13	RCOM ON RCOM OFF	ENABLE RTD MODULE COMMUNICATION FAILURE TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between RCOM ON and RCOM OFF	N / A	
14	IOCT ON IOCT OFF	ENABLE INSTANTANEOUS TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between IOCT ON and IOCT OFF	N / A	
15	PH R ON PH R OFF	ENABLE PHASE REVERSAL TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between PH R ON and PH R OFF	N / A	
16	INSQ ON INSQ OFF	ENABLE INCOMPLETE SEQUENCE TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between INSQ ON and INSQ OFF	N / A	
17	REMT ON REMT OFF	ENABLE REMOTE TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between REMT ON and REMT OFF	N / A	
18	DIFT ON DIFT OFF	ENABLE DIFFERENTIAL TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between DIFT ON and DIFT OFF	N / A	
19	INCT ON INCT OFF	ENABLE INCOM TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between INCT ON and INCT OFF	N / A	
20	TRNT ON TRNT OFF	ENABLE TRANSITION TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between TRNT ON and TRNT OFF	N / A	
21	ZSWT OFF ZSWT ON	ENABLE ZERO SPEED SWITCH TRIP TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between ZSWT ON and ZSWT OFF	N / A	
22	TBYP OFF TBYP ON	ENABLE TRIP BYPASS TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between TBYP OFF and TBYP ON	N / A	
P9	SP AUX1	SETPOINTS FOR AUX 1 RELAY OUTPUT CONFIGURATION		48 *	
1	LSPU XXX	LOAD SHED PICK-UP CURRENT AS % OF FLA	50-150%, OFF (1% increments)	N / A	
2	LSDO XXX	LOAD SHED DROP-OUT CURRENT AS % OF FLA	50-LSPU Value %, OFF (1% increments)	N / A	
3	LSDL XX	LOAD SHED DELAY IN 1/10 SECONDS	0-5 sec. (1/10 sec. increments)	N / A	
			If LSPU and LSDO are both set to OFF then the SP AUX1 functions below are	N / A	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
			available.		
4	GF A ON GF T ON GF OFF	ENABLE GROUND FAULT ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between GF A ON, GF T ON, and GF OFF	48 *	
5	I2T A ON I2T T ON I2T OFF	ENABLE I2T ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between I2T A ON, I2T T ON, and I2T OFF	48 *	
6	JAM A ON JAM T ON JAM OFF	ENABLE JAM ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between JAM A ON, JAM T ON, and JAM OFF	48 *	
7	UL A ON UL T ON UL OFF	ENABLE UNDERLOAD ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between UL A ON, UL T ON, and UL OFF	48 *	
8	UB A ON UB T ON UB OFF	ENABLE PHASE UNBALANCE ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between UB A ON, UB T ON, and UB OFF	48 *	
9	WD A ON WD T ON WD OFF	ENABLE WINDING TEMP ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between WD A ON, WD T ON, and WD OFF	48 *	
10	MB A ON MB T ON MB OFF	ENABLE MOTOR BEARING TEMP ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between MB A ON, MB T ON, and MB OFF	48 *	
11	LB A ON LB T ON LB OFF	ENABLE LOAD BEARING TEMP ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between LB A ON, LB T ON, and LB OFF	48 *	
12	AX A ON AX T ON AX OFF	ENABLE AUXILIARY RTD TEMP ALARM OR TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between AX A ON, AX T ON, and AX OFF	N / A	
13	SX A ON SX T ON SX OFF	ENABLE STARTS PER TIME TRIP OR ALARM TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between SX A ON, SX T ON, and SX OFF	N / A	
14	TBS T ON TBS OFF	ENABLE TIME BETWEEN STARTS TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between TBS T ON, and TBS OFF	N / A	
15	RTDF ON RTDF OFF	ENABLE RTD FAILURE DIAGNOSTIC TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between RTDF ON and RTDF OFF	N / A	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
16	RCOM ON RCOM OFF	ENABLE RTD MODULE COMMUNICATION FAILURE TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between RCOM ON and RCOM OFF	N / A	
17	IOCT ON IOCT OFF	ENABLE INSTANTANEOUS OVERCURRENT TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between IOCT ON and IOCT OFF	48 *	
18	PH R ON PH R OFF	ENABLE PHASE REVERSAL TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between PH R ON and PH R OFF	48 *	
19	INSQ ON INSQ OFF	ENABLE INCOMPLETE SEQUENCE TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between INSQ ON and INSQ OFF	N / A	
20	REMT ON REMT OFF	ENABLE REMOTE TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between REMT ON and REMT OFF	N / A	
21	DIFT ON DIFT OFF	ENABLE DIFFERENTIAL TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between DIFT ON and DIFT OFF	N / A	
22	INCT ON INCT OFF	ENABLE INCOM TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between INCT ON and INCT OFF	N / A	
23	TRNT ON TRNT OFF	ENABLE TRANSITION TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between TRNT ON and TRNT OFF	N / A	
24	ZSWT ON ZSWT OFF	ENABLE ZERO SPEED SWITCH TRIP TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between ZSWT ON and ZSWT OFF	N / A	
25	TBYP OFF TBYP ON	ENABLE TRIP BYPASS TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLE	Toggles between TBYP OFF and TBYP ON	N / A	
P10	SP AUX2	SETPOINTS FOR AUX 2 RELAY OUTPUT CONFIGURATION		N / A *	
1	TRN ON TRN OFF	ENABLE TRANSITION OUTPUT IF ENABLED ALL OTHER FUNCTIONS FOR AUX 2 ARE DISABLED	Toggles between TRN ON and TRN OFF If TRN is set to OFF then the SP AUX2 functions below are available.	N / A	
2	GF A ON GF T ON GF OFF	ENABLE GROUND FAULT ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between GF A ON, GF T ON, and GF OFF	N / A	
3	I2T A ON I2T T ON	ENABLE I2T ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between I2T A ON, I2T T ON, and I2T OFF	N / A	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
	I2T OFF				
4	JAM A ON JAM T ON JAM OFF	ENABLE JAM ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between JAM A ON, JAM T ON, and JAM OFF	N / A	
5	UL A ON UL T ON UL OFF	ENABLE UNDERLOAD ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between UL A ON, UL T ON, and UL OFF	N / A	
6	UB A ON UB T ON UB OFF	ENABLE PHASE UNBALANCE ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between UB A ON, UB T ON, and UB OFF	N / A	
7	WD A ON WD T ON WD OFF	ENABLE WINDING TEMP ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between WD A ON, WD T ON, and WD OFF	N / A	
8	MB A ON MB T ON MB OFF	ENABLE MOTOR BEARING TEMP ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between MB A ON, MB T ON, and MB OFF	N / A	
9	LB A ON LB T ON LB OFF	ENABLE LOAD BEARING TEMP ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between LB A ON, LB T ON, and LB OFF	N / A	
10	AX A ON AX T ON AX OFF	ENABLE AUXILIARY RTD TEMP ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between AX A ON, AX T ON, and AX OFF	N / A	
11	SX A ON SX T ON SX OFF	ENABLE STARTS PER TIME TRIP OR ALARM TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between SX A ON, SX T ON, and SX OFF	N / A	
12	TBS T ON TBS OFF	ENABLE TIME BETWEEN STARTS TRIP OR TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between TBS T ON, and TBS OFF	N / A	
13	RTDF ON RTDF OFF	ENABLE RTD FAILURE DIAGNOSTIC TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between RTDF ON and RTDF OFF	N / A	
14	RCOM ON RCOM OFF	ENABLE RTD MODULE COMMUNICATION FAILURE TO ACTIVATE ALARM RELAY OUTPUT OR DISABLE	Toggles between RCOM ON and RCOM OFF	N / A	
15	IOC A ON IOC T ON IOC OFF	ENABLE INSTANTANEOUS OVERCURRENT ALARM OR TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between IOCT ON and IOCT OFF	N / A	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
16	PH R ON PH R OFF	ENABLE PHASE REVERSAL TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between PH R ON and PH R OFF	N / A	
17	INSQ ON INSQ OFF	ENABLE INCOMPLETE SEQUENCE TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between INSQ ON and INSQ OFF	N / A	
18	REMT ON REMT OFF	ENABLE REMOTE TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between REMT ON and REMT OFF	N / A	
19	DIFT ON DIFT OFF	ENABLE DIFFERENTIAL TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between DIFT ON and DIFT OFF	N / A	
20	INCT ON INCT OFF	ENABLE INCOM TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between INCT ON and INCT OFF	N / A	
21	TRNT ON TRNT OFF	ENABLE TRANSITION TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between TRNT ON and TRNT OFF	N / A	
22	ZSWT ON ZSWT OFF	ENABLE ZERO SPEED SWITCH TRIP TO ACTIVATE AUX2 RELAY OUTPUT OR DISABLE	Toggles between ZSWT ON and ZSWT OFF	N / A	
23	TBYP OFF TBYP ON AUTO RST MAN RST	ENABLE TRIP BYPASS TO ACTIVATE AUX1 RELAY OUTPUT OR DISABLESET AUX2 RELAY LATCHING MODE AUTO RST – AUTOMATIC AUX2 RESET MAN RST – MANUAL AUX2 RESET	Toggles between TBYP OFF and TBYP ON Toggles between AUTO RST and MAN RST	N / A	
P11	SP A OUT	SETPOINT FOR ANALOG OUTPUT CONFIGURATION (4-20 MA)		47	
1	MAX 100 MAX 125 MAX WRTD MAX %I2T	MAX 100 – 20 MA FOR 100% FLA MAX 125 – 20 MA FOR 125% FLA MAX WRTD – 20 MA FOR TRIP LEVEL MAX %I2T – 20 MA FOR 100% I2T	Toggles between MAX 100, MAX 125, MAX WRTD, and MAX %I2T	47	
P12	SP SYS	SETPOINTS FOR SYSTEM CONFIGURATION		N / A *	
1	TP MODE	CONFIGURE TRIPSSC RELAY OUTPUT TO BE MODE 1 – TRIPSSC RELAY ENERGIZES ON TRIPSSC EVENT OR MODE 2 – TRIPSSC RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES ON TRIPSSC EVENT	Toggles between TP MODE1 and TP MODE2	44	
2	AL MODE	CONFIGURE ALARM RELAY OUTPUT TO BE MODE 1 – ALARM RELAY ENERGIZES ON ALARM EVENT OR MODE 2 – ALARM RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES	Toggles between AL MODE1 and AL MODE2	N / A *	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
		ON ALARM EVENT			
3	AX1 MOD	CONFIGURE AUX1 RELAY OUTPUT TO BE MODE 1 – AUX1 RELAY ENERGIZES ON AUX1 EVENT OR MODE 2 – AUX1 RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES ON AUX1 EVENT	Toggles between AX1 MOD1 and AX1 MOD2	N / A	
4	AX2 MOD	CONFIGURE AUX2 RELAY OUTPUT TO BE MODE 1 – AUX2 RELAY ENERGIZES ON AUX2 EVENT OR MODE 2 – AUX2 RELAY ENERGIZES ON POWER UP AND DE-ENERGIZES ON AUX2 EVENT	Toggles between AX2 MOD1 and AX2 MOD2	N / A	
5	MAN I2T AUTO I2T	AUTO OR MANUAL I2T RESET	Toggles between MAN I2T and AUTO I2T	21	
6	RUN PGM STOP PGM	ENABLES UNIT TO BE PROGRAMMED WHILE MOTOR IS RUNNING	Toggles between RUN PGM and STOP PGM	51	
7	EMRG EN EMRG DIS	EMERGENCY OVERRIDE ENABLE EMRG EN – ENABLE EMERGENCY OVERRIDE EMRG DIS – DISABLE EMERGENCY OVERRIDE	Toggles between EMRG EN and EMRG DIS		
8	12 HOUR 24 HOUR	SET REAL TIME CLOCK DISPLAY 12 HOUR – AM/PM TIME DISPLAYED 24 HOUR – 24 HOUR TIME DISPLAYED	Toggles between 12 HOUR and 24 HOUR		
9	MONTH XX	13 SET REAL TIME CLOCK MONTH	Month 1-12 (1 month increments)		
10	DAY XX	SET REAL TIME CLOCK DAY	Day 1-31 (1 day increments)		
11	YEAR XX	SET REAL TIME CLOCK YEAR	Year 0-99 (1 year increments)		
12	HOUR XX	SET REAL TIME CLOCK HOUR	Hour 0-23 (1 hour increments)		
13	MIN XX	SET REAL TIME CLOCK MINUTE	Minute 0-59 (1 minute increments)		
14	M D Y D M Y	SET REAL TIME DATE DISPLAY MONTH DAY YEAR OR DAY MONTH YEAR	Toggles between M D Y and D M Y		
15	IQ2 EN IQ2 DIS	IMPACC COMMUNICATIONS MODE IQ2 EN – IQ1000II EMULATION IQ2 DIS – MP-1003 COMMUNICATION	Toggles between IQ2 EN and IQ2 DIS	N / A *	
16	RLYF TRP	INTERNAL DIAGNOSTIC FAILURE ACTIVATES TRIP AND OR ALARM	Toggles between RLYF TRP, RLYF	N / A *	

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Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
	RLYF ALM RLYF T+A	RELAY	ALM and RLYF T+A		
17	INCT DIS INCT EN	INCOM TRIP DISABLED OR ENABLED	Toggles between INCT DIS and INCT EN	N / A *	
18	DISARMED ARMED	ARM OR DISARM TRIP RELAY WARNING DISARM WILL NOT ALLOW TRIP RELAY TO FUNCTION TRIP WARNING MP-3000 WILL BE DISARMED UPON EXIT OF PROGRAM MODE AND WILL NOT PROTECT THE MOTOR-ENTER ARMED INTO SETPOINT TO PROTECT THE MOTOR	Toggles between ARMED and DISARMED	N / A *	
P13	SP TEST	SETPOINTS FOR TESTING OUTPUTS			
1	3 PHASE 1 PHASE	SINGLE PHASE TEST MODE OR THREE PHASE PROTECTION MODE	Toggles between 3-PHASE and 1-PHASE	1	
2	TRP ENER TRP DENR	TRP ENER – ENERGIZE TRIP RELAY TRP DENR – DE-ENERGIZE TRIP RELAY	Toggles between TRP ENER and TRP DENR	N / A	
3	ALM ENER ALM DENR	ALM ENER – ENERGIZE ALARM RELAY ALM DENR – DE-ENERGIZE ALARM RELAY	Toggles between ALM ENER and ALM DENR	N / A	
4	AX1 ENER AX1 DENR	AX1 ENER – ENERGIZE AUXILIARY RELAY 1 AX1 DENR – DE-ENERGIZE AUXILIARY RELAY 1	Toggle between AX1 ENER and AX1 DENR	N / A	
5	AX2 ENER AX2 DENR	AX2 ENER – ENERGIZE AUXILIARY RELAY 2 AX2 DENR – DE-ENERGIZE AUXILIARY RELAY 2	Toggle between AX2 ENER and AX2 DENR	N / A	
6	AOUT 4 AOUT 12 AOUT 20	FORCE ANALOG OUTPUT 4 – FORCE A 4 MA OUTPUT 12 – FORCE A 12 MA OUTPUT 20 – FORCE A 20 MA OUTPUT	Toggle between AOUT ACT, AOUT 4, AOUT 12, AND AOUT 20	N / A	
7	DI 1OFF OR DI 1 ON	STATE OF DISCRETE INPUT 1	Read only	N / A	
8	DI 2 OFF OR DI2 ON	STATE OF DISCRETE INPUT 2	Read only	N / A	
P14	SP RESET	SETPOINTS FOR RESETTING HISTORY MODE PAGES		N / A	

Application Note: MP3k-01

Table 2. MP-3000 – IQ1000II Setpoint Cross Reference

Line No.	Line Display	Help Message	Setpoint Range Value Selection	IQ1000II Item No.	Selected Value
1	MTR RST PUSH RST	MTR RST – PUSH RAISE TO ENABLE MOTOR HISTORY RESET PUSH RST – PUSH RESET TO EXECUTE RESET OF MOTOR HISTORY OR PUSH RAISE TO NOT RESET	Toggle between PUSH RESET and return to MTR RST	35 & 36	
2	TRIP RST PUSH RST	TRIP RST – PUSH RAISE TO ENABLE TRIP HISTORY RESET PUSH RST – PUSH RESET TO EXECUTE RESET OF TRIP HISTORY OR PUSH RAISE TO NOT RESET	Toggle between PUSH RESET and return to TRIP RST	49	
3	ALRM RST PUSH RST	ALRM RST – PUSH RAISE TO ENABLE ALARM HISTORY RESET PUSH RST – PUSH RESET TO EXECUTE RESET OF ALARM HISTORY OR PUSH RAISE TO NOT RESET	Toggle between PUSH RESET and return to ALRM RST		
4	TOT RST PUSH RST	TOT RST - PUSH RAISE TO ENABLE TOTAL HISTORY RESET PUSH RST - PUSH RESET TO EXECUTE RESET OF ALARM HISTORY OR PUSH RAISE TO NOT RESET	Toggle between PUSH RESET and return to TOT RST		